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ABSTRACT

This document presents tables, graphs, and narrative text that provide information for planning Washington's early intervention programs for infants and toddlers. Data were analyzed on the number and characteristics of infants and toddlers with disabilities and special health problems who were enrolled in Washington State public services at four timepoints: December 1, 1993; May 1, 1995; December 1, 1995; and May 1, 1996. Major findings include the following: (1) the enrollment rate has been generally stable; (2) the national prevalence rate has been consistently higher than the Washington State enrollment rate; (3) the enrollment rate for Medicaid eligible children was consistently higher than that for non-Medicaid children; (4) rural counties have higher enrollment rates; (5) very low birthweight and extreme prematurity were the risk factors associated with the highest enrollment rates; (6) enrollment rates between 5 and 10 percent were found for medium low birthweight infants, moderately preterm infants, infants with Apgar scores of less than 8, and infants born to mothers who received no prenatal care, who were identified as substance abusers, or who were younger than 15 years old; and (7) among children who were Medicaid eligible, enrollment rates were highest for children with Down Syndrome and cerebral palsy compared to other children with specific medical conditions. (Contains 37 references.) (CR)

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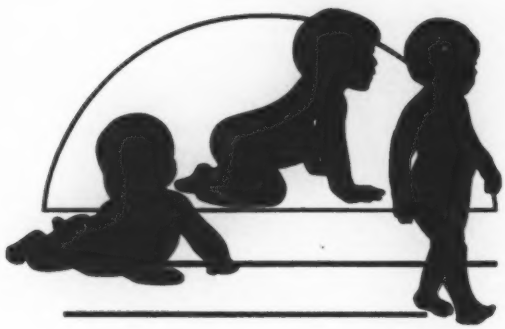

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EC 305543

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Enrollment of Washington Children with Disabilities
and Special Health Care Needs
in Washington State Public Programs

A Comparison of Enrollment Counts on December 1, 1993, May 1, 1995, December 1, 1995, and May 1, 1996

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ACRONYMS

CCDB	Common Client Database
CFH	Community Family Health
CHIF	Child Health Intake Form
CHRIS	County Human Resource Information System
CSHCN	Children with Special Health Care Needs
DDD	Division of Developmental Disabilities
DOH	Department of Health
DSHS	Department of Social and Health Services
FPL	Federal Poverty Level
FRC	Family Resources Coordinator
FS	First Steps
FSDB	First Steps Data Base
IDEA	Individuals with Disabilities Education Act
IEP	Individualized Education Plan
IFSP	Individualized Family Service Plan
ISP	Individualized Service Plan
ITEIP	Infant Toddler Early Intervention Program
NHIS	National Health Interview Survey
OFM	Office of Financial Management
OSPI	Office of Superintendent of Public Instruction
RDA	Research and Data Analysis
SE	Special Education
SICC	State Interagency Coordinating Council

EXECUTIVE SUMMARY

An estimated 2.5% of children under the age of three in the state of Washington have delaying or disabling conditions. Infants and toddlers with disabilities and their families are eligible to receive an array of public early intervention services although all may not seek enrollment in state programs. State agencies, families, and local communities share a common vision for developing a system of coordinated, comprehensive, family-centered and culturally relevant early intervention services for these children with developmental disabilities and their families.

This report presents information on infants and toddlers, birth to three with delaying or disabling conditions who were enrolled in Washington State public services at four timepoints: December 1, 1993; May 1, 1995; December 1, 1995; and May 1, 1996. A child was defined as enrolled if the child 1) was determined to be eligible for services and/or 2) had an individualized service plan.

Summary of Findings

- The Washington State enrollment rate has been generally stable from December 1, 1993, to May 1, 1996, with a slight increase from a rate of 1.65% at the first count to 1.79% at the fourth count.

- Over 70% of the children who were enrolled on December 1, 1993, and were less than three years old on May 1, 1996, were still enrolled on May 1, 1996.

- The national prevalence rate estimated from the National Health Interview Survey (NHIS) (1.8% – 2.1%), whether adjusted for Washington State poverty levels or not, has been consistently higher than the Washington State enrollment rate. Not all eligible children are enrolled in publicly funded early intervention programs. Children may receive early intervention services funded through private pay, private insurance, military programs, or charitable grants.

- The enrollment rate (2.4% – 3.1%) for Medicaid eligible children, with family incomes up to 200% of the Federal Poverty Level (FPL), was consistently higher than that for Non-Medicaid children (0.8% – 1.1%) over the four counts. Similarly, the national prevalence rate of reported limitations for children in lower income families (2.3% – 2.9%) was higher than for children in families with incomes greater than 200% of the FPL (1.4% – 1.5%).

- The proportion of enrolled children who were Medicaid eligible (70%) remained stable over time and was significantly greater than that for all children in Washington (42% – 45%). Similarly, the proportion of NHIS children with reported limitations who are at or below 200% of the FPL (55% – 64%) was significantly greater than for all children under three (44% – 47%).

- For all Washington births, rural counties as a group have moderately higher enrollment rates (2.3% – 2.7%) than small urban counties (1.6% – 2.2%) and substantially higher enrollment rates than metropolitan counties (1.2% – 1.8%).

- Very low birthweight and extreme prematurity were the risk factors associated with the highest enrollment rates, 21.8% and 19.3%, respectively.

- Enrollment rates between 5% and 10% were found for medium low birthweight infants, moderately preterm infants, infants with Apgar scores of less than 8, and infants born to mothers who received no prenatal care, who had been identified as substance abusers, or who were less than 15 years old.

- Among children who were Medicaid eligible, enrollment rates were highest for children with Down Syndrome (87.7%) and cerebral palsy (65.3%) compared to other children with specific medical conditions.

- Medicaid eligible children who were diagnosed with other conditions associated with developmental delay also had high enrollment rates: cleft lip and/or palate (62.6%), developmental speech and language disorder (42.4%), and other developmental disorder or delay (41.1%).

The analyses and results presented in this report provide baseline data for planning and discussion at the state and local levels, and facilitate decision making and priority setting for Washington's early intervention programs for infants and toddlers with delaying or disabling conditions.

CHAPTER 1

INTRODUCTION

This report presents information on infants and toddlers, birth to three, with delaying or disabling conditions who were enrolled in Washington State public services at four timepoints: December 1, 1993; May 1, 1995; December 1, 1995; and May 1, 1996. This report compares the following measures across the four data collection points: unduplicated enrollment count, state enrollment rates and patterns versus national prevalence rates and patterns, and county enrollment rates versus state enrollment rates. The relationship of risk factors to the enrollment of children in early intervention programs is also examined.

The analyses and results presented in this report provide baseline data for planning and discussion at the state and local levels, and facilitate decision making and priority setting for Washington's early intervention programs for infants and toddlers with delaying or disabling conditions.

Washington's Infant Toddler Early Intervention Program (ITEIP) Study, an extension of the Birth to Three Study, is funded by the Department of Social and Health Services (DSHS) ITEIP.

BACKGROUND

With the passage of the Education for All Handicapped Children Act (Public Law 94-142) in 1975, later retitled the Individuals with Disabilities Education Act (IDEA), the educational rights of students with disabilities were ensured. This legislation evolved from various state statutes and federal court cases based on the United States Constitution (Martin et al., 1996). Under IDEA, Part B, states were mandated to provide special education services to children with disabilities who are between 3 and 21.

Passage of the 1986 amendments to IDEA, Public Law 99-457, established Part H of IDEA. The Part H program in Washington State is named the Infant Toddler Early Intervention Program (ITEIP). Washington State chose DSHS as the lead agency for Part H federal funds. Policy makers at the federal level recognized the importance of early referral and intervention for infants and toddlers under the age of three and passed these amendments.

In Washington State, public early intervention services for infants and toddlers birth to three with delaying or disabling conditions were provided by school districts, neurodevelopmental centers, developmental centers, and other agencies. The IDEA, Part H program acts as an umbrella and provides linkages and enhancement of these services to ensure a statewide system of comprehensive, multi-disciplinary, coordinated services to infants and toddlers with disabilities and their families. In October 1994, Washington State began full implementation of Part H. The five participating state agencies include Department of Social and Health Services, Department of Community, Trade and Economic Development, Department of Health, Department of Services for the Blind, and Office of the Superintendent of Public Instruction.

The section of Part H requiring the delivery of family centered early intervention services relates to a new direction in early intervention which focuses on enhancing the quality of early parent-infant interactions (Bennett and Guralnick, 1991). The early parent-infant relationship has been recognized as a fundamental determinant of the child's later development (Ainsworth, 1973; Bowlby, 1969; Tjossem, 1976).

Research on the effectiveness of early intervention programs began with traditional scientific methods aimed at the heterogeneous population of children with developmental delays and disabilities. It has evolved to include research studies focusing on the most efficacious types of intervention for specific groups of infants and children and their families (Bennett and Guralnick, 1991).

Tjossem (1976) identified three categories of vulnerable infants in need of early intervention to ensure their optimal cognitive and functional development: infants with established disabilities, infants at environmental risk, and infants at biological risk. Definitions of these risk categories are given in Chapter 6. Early intervention strategies are different for children with established disabilities than for children with biologic or environmental risk conditions.

Based on an extensive early intervention research database, two studies utilizing meta-analysis* techniques found a modest but positive impact associated with early intervention services provided to infants and children with *established disabilities* (Casto and Mastropieri, 1986; Shonkoff and Hauser-Cram, 1987). Harding and Keating (1995) noted that modest developmental gains are significant for severely-impaired children.

Early educational intervention was found to be associated with positive effects on the cognitive development of preschoolers *environmentally at-risk* (Casto and White, 1984; Lazar and Darlington, 1982; Ramey and Campbell, 1992; Wasik et al., 1990) and preschoolers at *biological risk* due to low birthweight and prematurity (Blair et al., 1995; Ramey et al., 1992; Rauh et al., 1988; Scarr-Salapatek and Williams, 1973).

The Infant Health Development Program was the most comprehensive, intense, controlled efficacy trial of early intervention for biologically vulnerable infants and toddlers (Ramey et al., 1992). This eight-site, randomized, clinical trial investigated the efficacy of an intensive, integrated health and education program for low birthweight, premature infants—a group of infants at risk for poor cognitive development—during the first three years of life. The trial included four main intervention modalities: pediatric monitoring and referral, home visits by a family educator, parent support groups, and attendance at a full-day child development center operated by early childhood educators. The study findings linked intensity of intervention services with degree of positive cognitive outcomes for high risk infants, suggesting a dose-response relationship between intervention and outcome (Blair et al., 1995).

* Meta-analysis is a statistical technique which draws conclusions from the combined results of separate studies.

CHAPTER 2

METHODS

This report presents information about enrollment in public early intervention programs in Washington State. Infants and toddlers under the age of three enrolled in early intervention programs were counted on the following dates: December 1, 1993; May 1, 1995; December 1, 1995; and May 1, 1996. For these counts, the DSHS Research and Data Analysis office (RDA) collected records including the names, dates of birth, gender, and residence zip codes of enrolled children. Using these enrollment records and data in the First Steps Database (FSDB), RDA compiled information on trends and patterns in early intervention program enrollment.

Information has been presented for each of the first three counts in earlier reports. This report describes the results of all four counts.

DATA SOURCES

The basic component of this study is a listing of children under the age of three enrolled in Washington State public services for those with delaying or disabling conditions. This listing, a snapshot in time of the population enrolled in early intervention programs, was obtained by surveying service providers and by extracting client records from databases maintained by DSHS/DDD and DOH/Children with Special Health Care Needs (CSHCN). The service providers are listed in the table on page 5.

Provider Surveys

Prior to the date of each count, surveys were mailed to providers of early intervention services. The surveys requested a listing of every child under the age of three who was enrolled with the provider on the date of the count. A child was defined as enrolled if the child 1) was determined to be eligible for services and/or 2) had an Individualized Education Plan (IEP), an Individualized Service Plan (ISP), or an Individualized Family Service Plan (IFSP).

Surveys for the fourth count (May 1, 1996) were sent to 37 child development programs, 7 neurodevelopmental centers, 7 combined child development programs and neurodevelopmental centers, 296 school districts, of which 120 reported they were providing services either directly or through a contract with another provider, and 85 Family Resources Coordinators (FRCs). In addition, 41 school districts reported they would serve, but no children were identified for this count. Previous surveys are described in earlier reports (Cawthon et al., 1995; Keenan et al., 1996; Lonner et al., 1994).

Agency Databases

Records were received from two databases maintained by DSHS/DDD. The Common Client Database (CCDB) provided a list of clients known to DDD who were under the age

of three on the date of each count. The County Human Resource Information System (CHRIS) provided information about the disability-related service(s) in which these individuals were enrolled.

The database of Community Family Health (CFH), DOH included data from the Child Health Intake Form (CHIF) and the provider's Health Services Authorization Form (CSHCN) for those children under the age of three who were enrolled in at least one disability related DOH/CFH service on the date of each count.

UNDUPLICATION AND MATCH

In order to compute a count of children enrolled in early intervention programs and to facilitate detailed analysis of patterns and trends in early intervention program enrollment, client records were unduplicated across programs and across counts and matched with the First Steps Database (FSDB). Records belonging to the same child were identified using first name, last name, middle name, gender and date of birth.

(*Please refer to* APPENDIX B: UNDUPLICATION AND MATCH PROCEDURES *for more information about unduplication and match procedures.*)

Internal Unduplication

In a given count, receipt of more than one record for a single child was frequent. A process of internal unduplication, combining duplicate records, allowed compilation of an accurate count of children enrolled in early intervention services.

Match with the First Steps Database

The First Steps Database (FSDB) was established and is maintained by RDA. The FSDB is a single repository for information taken from birth certificates, infant death certificates, Medicaid claim records for maternal and infant services, and Medicaid eligibility histories. Birth certificates and death certificates, provided by the Department of Health Center for Health Statistics, contain data about prenatal care, pregnancy outcomes, and maternal demographic characteristics for all births to Washington State residents. Within the FSDB, individual birth certificates are linked to Medicaid claims and eligibility histories, providing extensive information on medical procedures, medical diagnoses, and Medicaid payments for maternal and infant care.

Match across Counts

In order to compute the total number of children reported in any of the four counts and to analyze trends in early intervention enrollment, client records were matched across the four counts. In addition, another match with the FSDB was conducted for all early intervention records not previously matched to the FSDB. The match across counts improved the completeness and accuracy of both the internal unduplication and the match with the FSDB.

Service Providers

Existing public services are provided and/or funded through the Infant Toddler Early Intervention Program (ITEIP), Family Resources Coordinators (FRCs), the Department of Health (DOH) Children with Special Health Care Needs (CSHCN), the Department of Social and Health Services (DSHS) Division of Developmental Disabilities (DDD), and the Office of the Superintendent of Public Instruction (OSPI) Special Education (SE).

ITEIP (DSHS) is responsible for the coordination of planning, development, and the implementation of collaborative interagency and multi-disciplinary delivery of early intervention services to infants and toddlers with disabilities and their families as defined in the Individuals with Disabilities Education Act (IDEA), Part H. Program implementation occurs through local contracts with a variety of local contractors. These specific contractors are determined in coordination with County Interagency Coordinating Councils, Indian Tribes, and the Washington Migrant Council.

FRCs are professional and paraprofessional community workers trained by ITEIP and employed by provider agencies or parent advocacy organizations through contracts with the state. Their tasks are to support families, to seek and provide information about community organizations, to coordinate child find, to ensure evaluations and assessments, to facilitate Individualized Family Service Plans (IFSPs), and to coordinate services and activities with community and agency resources.

CSHCN (DOH) serves a population that includes children under the age of 18 who have disabilities and handicapping conditions, chronic illnesses, and health related educational or behavioral problems, or who are at risk for these conditions. The services provided include early identification, multi-disciplinary assessment, diagnostic and treatment services, neuro-developmental therapies, care coordination and referral. These services are provided for the birth-to-three population by CSHCN local contractors including 33 local health jurisdictions and 14 neurodevelopmental centers.

DDD (DSHS) funds early intervention services for young children from birth to age three through contracts with county governments as locally prioritized by county planners. The county developmental disability branch selects and contracts with service providers for child development services. There are 44 child development programs in the state of Washington. These services, designed to maximize a child's developmental potential, include developmental therapy, parent education and training.

OSPI administers and funds special education programs provided by local school districts and educational service districts. For the May1, 1996, count, 120 school districts reported they were providing services to children with disabilities ages birth to three, either directly or by contract with a child developmental center (DDD) or neurodevelopmental center (DOH).

Additionally, birth-to-three early intervention services are available through private service providers (pediatricians or therapists) and may be funded by private pay, private insurance, DSHS Medical Assistance programs, other DSHS programs (e.g., Mental Health and Children and Family Services), Tribal authorities, the military and non-profit service organizations such as the Elks, Shriners, United Way, and others.

ANALYSIS GROUPS AND ENROLLMENT RATES

Analysis Groups

In conducting the analyses presented in the previous three reports, three analysis groups were generated. Beginning with the unduplicated records of all children enrolled in early intervention services, records were selected to form successive analysis groups. These smaller analysis groups facilitated investigation of information not available for some of the enrolled children.

The following three analysis groups used in the previous reports were retained in this report:

Enrolled Children. This group is the entire population of children identified as enrolled in early intervention programs at the time of the count. The Enrolled Children group was used to compute the unduplicated count of enrolled children.

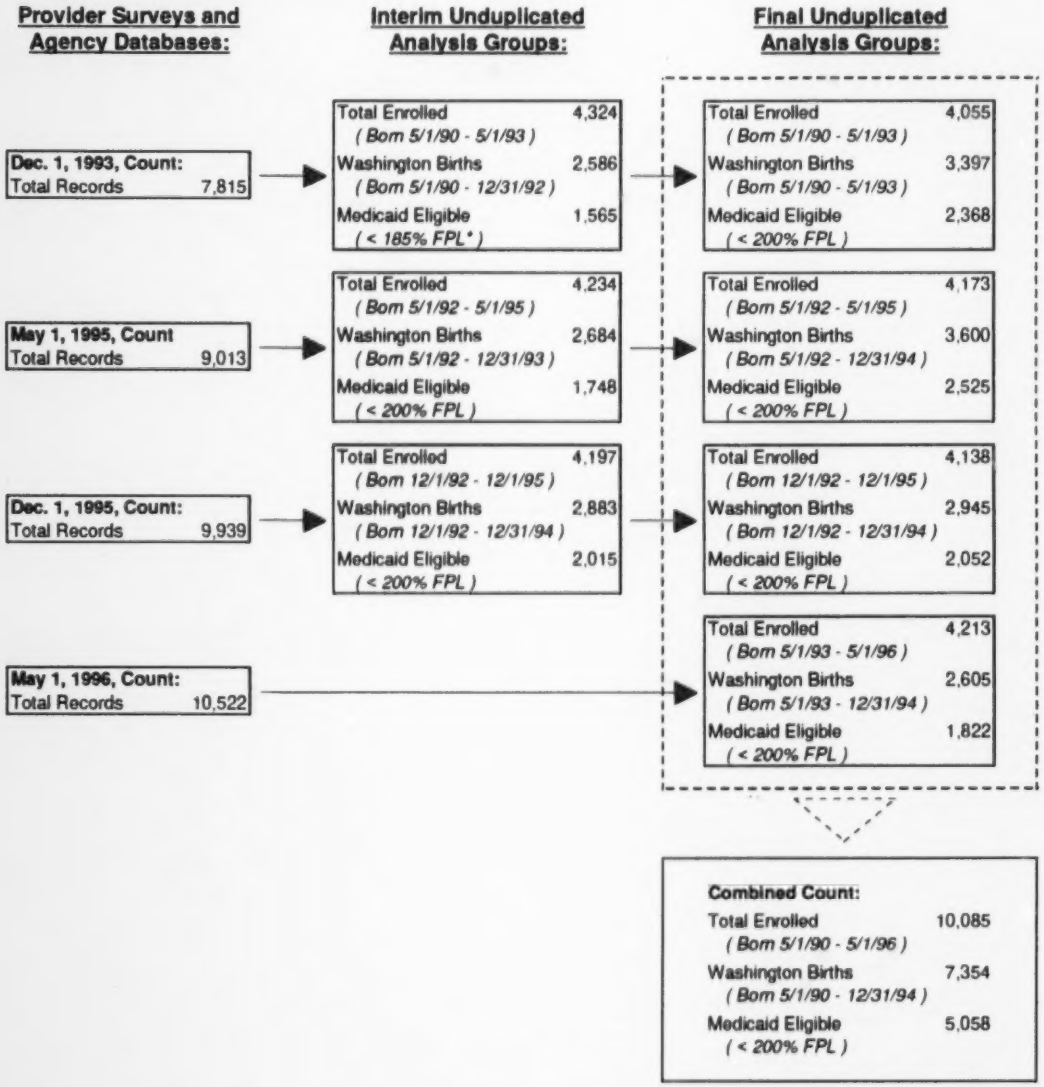
Enrolled Washington Births. This group contains only those children in the Enrolled Children group that were matched with records in the FSDB. These are children born to Washington residents on or before December 31, 1994. A record may not have matched with the FSDB because the child's birth certificate was not yet available, the child has had a name change, or the child's mother was not a Washington State resident at the time of the child's birth. The Enrolled Washington Births group was used for analysis of relationships between early intervention program enrollment and characteristics reported in the FSDB.

Enrolled Medicaid Eligible. This group contains only those children in the Enrolled Washington Births group that were Medicaid eligible. Medicaid eligible children have a family income at or below 200% of the Federal Poverty Level (FPL). A child was defined as Medicaid Eligible if 1) the child's mother was Medicaid eligible during pregnancy and/or 2) the child received Medicaid paid services in the first two years of life with a total cost in excess of $100. The Enrolled Medicaid Eligible group was used for analysis of income, medical diagnoses, and Medicaid expenditures and these variables' relationship to early intervention enrollment.

The diagram on the next page displays the progression from unduplicated records received from provider surveys and agency databases; to the *interim* unduplicated analysis groups, which appeared in the three previous reports; and then to the *final* unduplicated analysis groups, which appear in this report. For the three counts with interim analysis groups, Total Enrolled decreased in the final analysis groups, reflecting more complete unduplication, while Washington Births and Medicaid Eligible increased, reflecting more matches of early intervention records with the FSDB.

The May 1, 1996, count does not have interim analysis groups because internal unduplication and the match with the FSDB for this count occurred concurrently with the match across counts.

In addition to final analysis groups for each of the four counts, this report presents information about all children who were enrolled for any of the counts. The *combined count* is the result of the match across counts. Many children are reported in more than one count, so the analysis groups in the combined count are smaller than the final analysis groups summed across the four counts.


Provider Surveys and Agency Databases:
Interim Unduplicated Analysis Groups:
Final Unduplicated Analysis Groups:
Dec. 1, 1993, Count:
Total Records 7,815
Total Enrolled 4,324
(Born 5/1/90 - 5/1/93)
Washington Births 2,586
(Born 5/1/90 - 12/31/92)
Medicaid Eligible 1,565
(< 185% FPL*)
Total Enrolled 4,055
(Born 5/1/90 - 5/1/93)
Washington Births 3,397
(Born 5/1/90 - 5/1/93)
Medicaid Eligible 2,368
(< 200% FPL)
May 1, 1995, Count
Total Records 9,013
Total Enrolled 4,234
(Born 5/1/92 - 5/1/95)
Washington Births 2,684
(Born 5/1/92 - 12/31/93)
Medicaid Eligible 1,748
(< 200% FPL)
Total Enrolled 4,173
(Born 5/1/92 - 5/1/95)
Washington Births 3,600
(Born 5/1/92 - 12/31/94)
Medicaid Eligible 2,525
(< 200% FPL)
Dec. 1, 1995, Count:
Total Records 9,939
Total Enrolled 4,197
(Born 12/1/92 - 12/1/95)
Washington Births 2,883
(Born 12/1/92 - 12/31/94)
Medicaid Eligible 2,015
(< 200% FPL)
Total Enrolled 4,138
(Born 12/1/92 - 12/1/95)
Washington Births 2,945
(Born 12/1/92 - 12/31/94)
Medicaid Eligible 2,052
(< 200% FPL)
May 1, 1996, Count:
Total Records 10,522
Total Enrolled 4,213
(Born 5/1/93 - 5/1/96)
Washington Births 2,605
(Born 5/1/93 - 12/31/94)
Medicaid Eligible 1,822
(< 200% FPL)
Combined Count:
Total Enrolled 10,085
(Born 5/1/90 - 5/1/96)
Washington Births 7,354
(Born 5/1/90 - 12/31/94)
Medicaid Eligible 5,058
(< 200% FPL)

* *For the December 1, 1993, count, Medicaid Eligible in the interim analysis groups included only those children whose mothers were Medicaid eligible during pregnancy. These children had family incomes at or below 185% FPL. The ITEIP study expanded the definition of Medicaid Eligible for later reports.*

Enrollment Rates

This study uses the *enrollment rate* as a primary measure of early intervention enrollment patterns. The enrollment rate is defined as the percentage of a given group, the *population*, that is enrolled in early intervention services. Except for program enrollment the analysis group shares all of the characteristics of its population.

For example, to compute the enrollment rate for all male Washington births between May 1, 1993, and December 31, 1994, (population) for the May 1, 1996, count, one would divide the number of children in the population that were enrolled in early intervention programs on May 1, 1996, by the total population:

$$\frac{\textbf{analysis group}}{\textbf{population}} = \frac{\textbf{enrolled male births}}{\textbf{male births}} = \frac{\textbf{1,538}}{\textbf{66,314}} = \textbf{.0232} \quad \textbf{or} \quad \textbf{2.32\%}$$

The following three populations correspond with the three analysis groups listed above:

- The Washington State population of children under the age of three is the Office of Financial Management (OFM) estimate of Washington residents that are in this age group. OFM estimates are computed for April 1 of a given year. *Washington Population under 3* is the population for the Enrolled Children analysis group.

- Children born to Washington State residents is calculated from the complete listing of birth certificates within the FSDB. *Washington Births* is the population for the Enrolled Washington Births analysis group. Information in the FSDB is used to categorize children in this population, making it possible to calculate enrollment rates for various subgroups.

- Children born to Washington State residents with family incomes at or below 200% of the Federal Poverty Level (FPL) are identified using Medicaid eligibility and claims data within the FSDB. *Medicaid Eligible Washington Births* is the population for the Enrolled Medicaid Eligible analysis group.

NHIS National Prevalence Rates

The National Health Interview Survey (NHIS) is used to compare enrollment rates with *national prevalence rates*. The national prevalence rate is the percentage of a given group in the United States with delaying or disabling conditions.

The NHIS surveys a stratified sample of households in the United States, inquiring about the health status of individuals in the households. NHIS data includes information about age, as well as income and race/ethnicity, for persons identified in the survey.

(*Please refer to* APPENDIX C: NATIONAL HEALTH INTERVIEW SURVEY *for more information.*)

LIMITATIONS

As with any study using a complicated process of data collection and analysis, a number of limitations must be considered when drawing conclusions.

Enrolled Children

- Data were collected for children who were enrolled on the dates of the counts. The result is snapshots of children enrolled in early intervention programs at four points in time. These snapshots exclude children who were not enrolled on the day of the count. As a result, combined enrollment levels and rates for all the counts do not include all children who received services from December 1, 1993, through May 1, 1996.

  Being enrolled is a convention used to count the number of children who sought and were found eligible for public early intervention services. Being enrolled generally implies that the child has been assessed, determined eligible, and/or has been provided with a plan of service, defined somewhat differently by DDD/DSHS, DOH, and OSPI.

Data Sources

- Provider surveys for the first count (December 1, 1993) collected only the first initial, the first five letters of the last name, and the date of birth of an enrolled child. As a result, internal unduplication and the match with the FSDB was less accurate than would have resulted with more complete identifying information. Information gained in the match across counts led to some improvement in accuracy and completeness but did not fully address the problem of limited information in the first count. (*Please refer to* APPENDIX B: UNDUPLICATION AND MATCH PROCEDURES *for more information)*.

- One of the primary sources of data, the DOH/CFH database maintained by DOH/CSHCN, underwent substantial changes in data collection procedures over the course of the four counts. As a result, the level and patterns of enrollment for records collected from this database have varied between counts. This report highlights any trends in enrollment that appear to be solely the result of those changes.

Available Data in the FSDB

- The FSDB presently contains children born to Washington residents through 1994. As a result, enrolled children born after 1994 could not be matched with the FSDB. The second, third, and fourth counts (May 1, 1995, December 1, 1995, and May 1, 1996) all contain some children born after 1994. As a result, the absolute number of Enrolled Washington Births, as well as the corresponding Washington Births population, becomes progressively smaller in later counts.

In addition, the enrollment rate for Washington Births becomes progressively larger in later counts. As counts become further removed from the date of the last available birth certificates, only older children have dates of birth within the range of available birth certificates. Because older children are more likely to have had delaying or disabling conditions identified, the older Washington Births populations in the later counts have higher enrollment rates.

NHIS National Prevalence Rates

- In the NHIS, survey respondents are asked to identify persons in their households with limitations in major or minor activities. These limitations may only partially correspond to what is defined as delaying or disabling conditions in public law and program policies. (*Please refer to* APPENDIX C: NATIONAL HEALTH INTERVIEW SURVEY *for more information.*)

CHAPTER 3

WASHINGTON STATE UNDUPLICATED COUNT

This chapter analyzes trends in early intervention program enrollment for all children reported by service providers. The *Washington State enrollment rate* presented in this chapter is the percent of all children living in Washington under the age of three who are enrolled in public early intervention programs.

Washington State enrollment rates can be compared across counts since differences among counts in the availability of birth certificates do not affect the calculation of the Washington State enrollment rate.

All Children under Three Living in Washington
Number Enrolled in Early Intervention Programs and Enrollment Rate

	Dec.1, 1993	May 1, 1995*	Dec. 1, 1995	May 1, 1996
Enrolled Children	4,055	4,173	4,138	4,213
Washington Population under 3	245,182	238,314	238,314	234,894
Washington State Enrollment Rate	1.65%	1.75%	1.74%	1.79%

* *Changes in the DOH/CFH database caused over reporting of the enrollment for the May 1, 1995, count. When methods were used to control for the changes, the May 1, 1995, Washington State enrollment rate was lower than the December 1, 1995, rate.*

- The Washington State enrollment rate has been stable, with a slight increase across the four counts. For each of the counts, between 1.6% and 1.8% of all children living in Washington under the age of three have been enrolled in early intervention programs. Enrollment increased from 1.65% of the Washington State population under three on December 1, 1993, to 1.79% on May 1, 1996. Growth in the enrollment rate may reflect increased child find activities resulting from implementation of IDEA Part H. Washington State began full implementation of Part H in October of 1994.

ENROLLMENT BY PROVIDER

Three state agencies—DOH, DSHS, and OSPI—provide early intervention, education, and health services to children under the age of three with delaying or disabling conditions. Enrolled children experience a range of severity in delaying or disabling conditions and have substantial differences in the type and complexity of needs. Individual children may have their needs met by one provider or may require coordinated service from two or more providers.

The following table displays the distribution of children enrolled in public early intervention programs for each of the four counts.

All Children under Three Living in Washington
Number and Percent Enrolled in Early Intervention Programs by Agency*

	Dec.1, 1993	May 1, 1995	Dec. 1, 1995	May 1, 1996
Enrolled Children	4,055	4,173	4,138	4,213
Washington Population under 3	245,182	238,314	238,314	234,894
Washington State Enrollment Rate	1.65%	1.75%	1.74%	1.79%
DDD Enrolled				
Enrolled Children	2,184	2,238	2,358	2,270
% Total	*53.9%*	*53.6%*	*57.0%*	*53.9%*
DOH Enrolled				
Enrolled Children	2,483	2,628	2,410	2,702
% Total	*61.2%*	*63.0%*	*58.2%*	*64.1%*
OSPI Enrolled				
Enrolled Children	718	1,257	1,205	1,100
% Total	*17.7%*	*30.1%*	*29.1%*	*26.1%*
FRC Enrolled				
Enrolled Children	113	495	1,923	2,086
% Total	*2.8%*	*11.9%*	*46.5%*	*49.5%*

* *Many children receive coordinated services that are funded by more than one state agency. As a result, the sum of enrolled children across the four providers exceeds the total enrolled children.*

- DDD and DOH providers have reported the greatest number of children in each of the four counts. Enrollment with DDD and DOH providers has remained relatively stable, ranging from 2,184 to 2,358 children and from 2,410 to 2,702 children respectively. Some fluctuation in DOH enrolled children is due to changes in the DOH/CFH database.

- OSPI enrollment for the December 1, 1993, count is understated. After that count a change was made in methods of data collection. School districts were encouraged to report children served either directly or by contract.

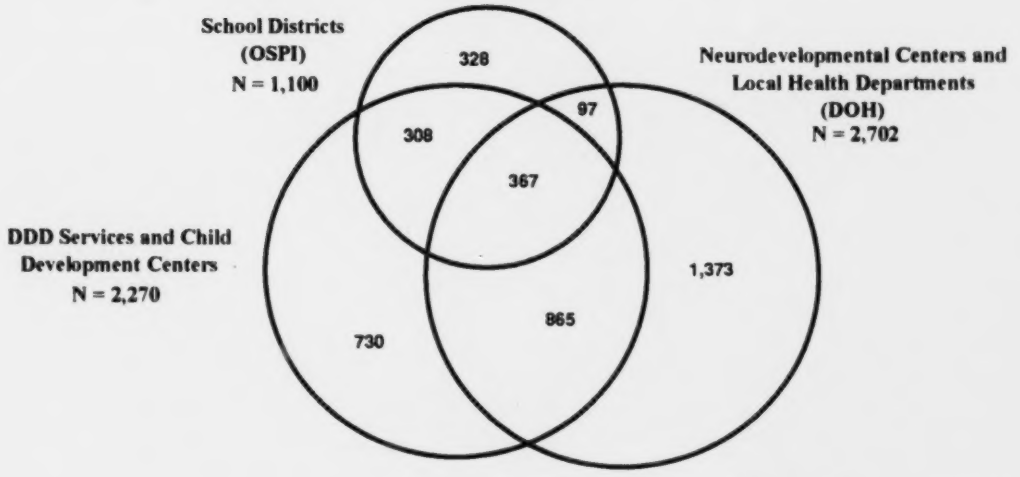
- The largest change in enrollment occurred among Family Resources Coordinators (FRCs). The growth in enrollment from 113 to 2,086 children reflects an expanding role of FRCs as well as changes in FRC reporting.

Unduplicated Enrollment by Service Providers for May 1, 1996, Count

Many children receive services from more than one state agency. The following graph and table display the degree of overlap in enrollment for the May 1, 1996, count. They show the distribution of enrolled children across various combinations of state agencies. Unduplicated enrollment by service providers for the three counts before May 1, 1996, is contained in previous reports.

The overlap of children enrolled by DDD, DOH, and OSPI is displayed. FRC enrollment is reported in the table.

Unduplicated Enrollment by Service Providers
May 1, 1996



		Unduplicated Children	Percent of Total
Children reported by one provider:	DDD Only	730	17.3%
	DOH Only	1,373	32.6%
	OSPI Only	328	7.8%
Children reported by two providers:	DDD and DOH, not OSPI	865	20.5%
	DDD and OSPI, not DOH	308	7.3%
	DOH and OSPI, not DDD	97	2.3%
Children reported by all three providers:	DDD, DOH, and OSPI	367	8.7%
Additional children reported by:	FRCs only	145	3.4%
	Total	**4,213**	**100.0%**

DURATION OF ENROLLMENT

Linking children across counts makes it possible to determine which children were enrolled on the dates of more than one count. This section presents information about the duration of enrollment. It analyzes whether children remained in early intervention programs after being enrolled.

The table below tracks enrollment across counts. For all except the last count (May 1, 1996), the table shows by age the *original count*, the number of children enrolled in that count, and the following for each succeeding count: *still enrolled*, the number of children who were in the original count that were also enrolled in the succeeding count; *under three*, the number of children from the original count that were still under the age of three on the date of the succeeding count; and the *retention rate*, the percentage of under-three children who are still enrolled in early intervention services.

Duration of Enrollment in Early Intervention Programs
Enrolled Children Living in Washington*

Enrolled Children		Retention of Enrollment								
		May 1, 1995			December 1, 1995			May 1, 1996		
	Original Count	Still Enrolled	Under Three	Reten. Rate	Still Enrolled	Under Three	Reten. Rate	Still Enrolled	Under Three	Reten. Rate
December 1, 1993:										
0 - 1 Years Old	504	366	504	72.6%	360	504	71.4%	150	212	70.8%
1 - 2 Years Old	1,071	480	596	80.5%						
2 - 3 Years Old	1,511									
Total	**3,086**	**846**	**1,100**	**76.9%**	**360**	**504**	**71.4%**	**150**	**212**	**70.8%**
May 1, 1995:										
0 - 1 Years Old	370				311	370	84.1%	303	370	81.9%
1 - 2 Years Old	964				848	964	88.0%	828	964	85.9%
2 - 3 Years Old	1,702				540	601	89.9%			
Total	**3,036**				**1,699**	**1,935**	**87.8%**	**1,131**	**1,334**	**84.8%**
December 1, 1995:										
0 - 1 Years Old	447							374	447	83.7%
1 - 2 Years Old	1,031							952	1,031	92.3%
2 - 3 Years Old	1,781							864	936	92.3%
Total	**3,259**							**2,190**	**2,414**	**90.7%**

* *Changes in the DOH/CFH database cause duration of enrollment to be inconsistently reported across counts. This table includes only children who have been reported by a source other than the DOH/CFH database.*

- Over 70% of the children enrolled on December 1, 1993, who were under three on May 1, 1996, were still enrolled. The retention rate between December 1, 1995, and May 1, 1996, was over 90%.

CHAPTER 4

WASHINGTON STATE ENROLLMENT AND NATIONAL PREVALENCE

This chapter presents a comparison of Washington State early intervention program enrollment with estimates of the prevalence and characteristics of children with developmental delays in the United States.

The *prevalence rate* is the estimated percentage of the general population that have delaying or disabling conditions. This chapter uses results from the 1988 through 1993 editions of the National Health Interview Survey (NHIS) to estimate national prevalence rates. The NHIS, conducted by the National Center for Health Statistics (NCHS), surveys a stratified sample of households in the United States, asking respondents to provide information about their health.

Prevalence rates are the percentage of children in the NHIS reported with limitations in major or minor activities. These limitations may only partially correspond to what are defined as delaying or disabling conditions in public law or program policies.

(*Please refer to* APPENDIX C: NATIONAL HEALTH INTERVIEW SURVEY *for more information about the NHIS.*)

Washington State Enrollment Rate and National Prevalence Rate Including NHIS Adjusted for Washington Poverty All Children under Three*

	Dec.1, 1993	May 1, 1995	Dec. 1, 1995	May 1, 1996
Washington State Enrollment Rate	1.65%	1.75%	1.74%	1.79%
National Prevalence Rate	1.81%	1.94%	2.05%	2.10%
NHIS Adjusted for WA Poverty	1.75%	1.88%	2.00%	2.06%

* *NHIS adjusted for Washington poverty is calculated by applying national prevalence rates to Washington State's poverty profile. See Appendix C for corresponding NHIS years.*

- The national prevalence rate and the NHIS adjusted for Washington poverty have been consistently higher than the Washington State enrollment rate. Not all eligible children are enrolled in publicly funded early intervention programs. Some families may receive early intervention services funded through private pay, private insurance, military programs, or charitable grants.

- Slight increases over time in the Washington State enrollment rate (1.65% – 1.79%) are also reflected in the national prevalence rate (1.81% – 2.10%) and the NHIS adjusted for Washington poverty (1.75% – 2.06%).

ENROLLMENT RATES FOR WASHINGTON BIRTHS

Enrolled Washington births is a subset of all enrolled children living in Washington. Data is available in the FSDB for all children born to Washington residents between July 1988 and December 1994.

Many of the analyses appearing in this report are based on information in the FSDB. The *enrollment rate* for Washington births is the percent of children in the FSDB who were enrolled in early intervention programs.

Washington Children Enrolled in Early Intervention Programs
Children under Three Born to Washington Mothers

	Dec.1, 1993	May 1, 1995	Dec. 1, 1995	May 1, 1996
Enrolled Children	4,055	4,173	4,138	4,213
Enrolled Washington Births	3,397	3,600	2,945	2,605
Total Washington Births	237,102	208,466	161,657	129,665
Enrollment Rate	1.43%	1.73%	1.82%	2.01%

- The enrollment rate for Washington births (1.43% – 2.01%) increases at a faster rate than the Washington State enrollment rate for all children (1.65% – 1.79%). Enrollment rates are over stated for later counts for Washington births because younger children, not included in calculations for later counts, have lower enrollment rates than older children.

Please note: The number of children identified as enrolled Washington births is lower than the number of enrolled children because not all enrolled children could be matched to birth certificates. For children enrolled on May 1, 1995, December 1, 1995, and May 1, 1996, birth certificates were available only for children born in 1992, 1993, and 1994. For these three counts a progressively smaller percentage of enrolled children were matched to Washington birth certificates. For the December 1, 1993, count, complete birth certificates were available; however, some enrolled children could not be matched to birth certificates for other reasons, such as adoption, name changes and in-migration. If the mother was not a Washington resident at the time of the child's birth, no birth certificate is available in the FSDB. For the December 1, 1993, count, more than 80% of the enrolled children were included in the enrolled Washington births.

DISTRIBUTION OF CHILDREN BY AGE

Age is an important consideration when analyzing enrollment in early intervention programs. Mild developmental delays in very young children may not be identified by parents and providers. As children become older, delays may increase or become more apparent, making identification possible.

The following table compares Washington State enrollment rates and national prevalence rates by age for each of the four counts.

Washington State Enrollment and National Prevalence Rates
Children under Three Living in Washington and in the NHIS*

	Dec.1, 1993	May 1, 1995	Dec. 1, 1995	May 1, 1996
Enrolled Children	4,055	4,173	4,138	4,213
Washington Population under 3	245,182	238,314	238,314	234,894
Washington State Enrollment Rate	1.65%	1.75%	1.74%	1.79%
National Prevalence Rate	1.81%	1.94%	2.05%	2.10%
0 - 1 Years Old				
Washington State Enrollment Rate	1.08%	0.57%	1.03%	0.93%
National Prevalence Rate	1.24%	1.37%	1.43%	1.44%
1 - 2 Years Old				
Washington State Enrollment Rate	1.71%	1.77%	1.68%	1.88%
National Prevalence Rate	1.96%	1.89%	2.11%	2.19%
2 - 3 Years Old				
Washington State Enrollment Rate	2.13%	2.83%	2.44%	2.52%
National Prevalence Rate	2.26%	2.56%	2.64%	2.69%

* *Changes in the DOH/CFH database caused enrollment by age for the May 1, 1995, and May 1, 1996, counts to be inconsistent with other counts. The Washington State enrollment rates for children 1 – 2 and 2 – 3 years old are over reported for these two counts. The Washington State enrollment rates for children 0 – 1 years old are under reported for these two counts.*
See Appendix C for corresponding NHIS years

- The Washington State enrollment rates and national prevalence rates in each count are higher for older children.
- For children 2 – 3 years old, the range of the national prevalence rate (2.26% – 2.69%) approximates the ITEIP Washington State planning rate (2.5%) for children under three with developmental delays and disabilities.

DISTRIBUTION OF CHILDREN BY FAMILY INCOME

The following tables depict the distribution of enrolled children under three in Washington and children with limitations in the NHIS by relative family income.

Medicaid Eligibility Among All Children and Enrolled Children
Children under Three Born to Washington Mothers

	Dec.1, 1993		May 1, 1995		Dec. 1, 1995		May 1, 1996	
	Enrolled WA Births N=3,397	All WA Births N=237,102	Enrolled WA Births N=3,600	All WA Births N=208,466	Enrolled WA Births N=2,945	All WA Births N=161,657	Enrolled WA Births N=2,605	All WA Births N=129,665
Medicaid Eligible	69.7%	42.3%	70.1%	44.7%	69.7%	45.2%	69.9%	45.3%
Not Medicaid Eligible	30.3%	57.7%	29.9%	55.3%	30.3%	54.8%	30.1%	54.7%

Poverty Status Among All Children and Children with Reported Limitations
Children under Three in the NHIS*

	Dec.1, 1993		May 1, 1995		Dec. 1, 1995		May 1, 1996	
	Children with Limit'ns	All Children	Children with Limit'ns	All Children	Children with Limit'ns	All Children	Children with Limit'ns	All Children
At or below 200% FPL	54.8%	43.9%	57.0%	45.6%	61.0%	46.2%	63.6%	46.6%
Above 200% FPL	45.2%	56.1%	43.0%	54.4%	39.0%	53.8%	36.4%	53.4%

**See Appendix C for corresponding NHIS years.*

Comparison of enrolled children in Washington State to children in the NHIS with limitations by relative family income shows the following trends:

- The proportion of enrolled children who were Medicaid eligible (70%) was significantly greater than that for all children in Washington (42% – 45%).
- Similarly, the proportion of NHIS children with reported limitations who are at or below 200% FPL (55% – 64%) was significantly greater than for all children under three (44% – 47%).
- The proportion of enrolled children in Washington State who were Medicaid eligible remained stable over time.

The proportion of NHIS children with reported limitations who are at or below 200% FPL steadily increased from 54.8% to 63.6%, while the proportion of all NHIS children at or below 200% remained fairly stable (44% – 47%).

DISTRIBUTION OF CHILDREN BY RACE/ETHNICITY

The following tables depict the distribution of enrolled children under three in Washington and children in the NHIS with limitations by race/ethnicity.

Race / Ethnicity Among All Children and Enrolled Children
Children under Three Born to Washington Mothers

	Dec.1, 1993		May 1, 1995		Dec. 1, 1995		May 1, 1996	
	Enrolled WA Births N=3,397	All WA Births N=237,102	Enrolled WA Births N=3,600	All WA Births N=208,466	Enrolled WA Births N=2,945	All WA Births N=161,657	Enrolled WA Births N=2,605	All WA Births N=129,665
White	77.5%	78.0%	76.6%	76.4%	73.8%	76.0%	74.0%	75.8%
Hispanic	8.4%	8.2%	9.6%	9.1%	10.7%	9.3%	10.1%	9.5%
Asian / Pac. Is.	3.2%	5.4%	3.4%	5.8%	3.5%	6.0%	3.5%	6.0%
African Am.	4.6%	3.8%	4.2%	3.9%	5.0%	3.9%	5.3%	3.9%
Native Am.	4.0%	2.1%	3.8%	2.1%	4.3%	2.1%	4.3%	2.1%
Other / Unkn.	2.4%	2.5%	2.5%	2.8%	2.6%	2.8%	2.8%	2.8%

Race / Ethnicity among All Children and Children with Reported Limitations
Children under Three in the NHIS*

	Dec.1, 1993		May 1, 1995		Dec. 1, 1995		May 1, 1996	
	Children with Limit'ns	All Children	Children with Limit'ns	All Children	Children with Limit'ns	All Children	Children with Limit'ns	All Children
White	63.3%	67.5%	62.3%	64.6%	58.6%	64.1%	55.7%	63.5%
Hispanic	12.2%	13.8%	12.4%	15.3%	13.2%	15.2%	13.0%	15.1%
Asian / Pac. Is.	0.7%	2.6%	1.7%	3.2%	2.0%	3.6%	2.5%	4.1%
African Am.	23.5%	15.1%	21.9%	15.8%	24.7%	16.0%	26.5%	16.1%
Native Am.	0.4%	0.9%	1.6%	1.0%	1.5%	1.0%	2.2%	1.0%
Other / Unkn.	0.0%	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%	0.1%

**See Appendix C for corresponding NHIS years.*

- The general pattern of enrollment by race/ethnicity for Washington State is similar over the four time points.

  The representation of Asian/Pacific Islanders was lower among enrolled children than among all children.

  African American, Hispanic, and Native American children constitute larger proportions among enrolled than among all children born in Washington.

- The general pattern of enrollment by race/ethnicity for Washington conforms to the national pattern of reported limitations by race/ethnicity, with the exception of Hispanics.

DISTRIBUTION OF CHILDREN BY RACE/ETHNICITY AND INCOME LEVEL

The following tables display enrollment rates and national prevalence rates by race/ethnicity for children with similar family incomes.

Further examination of race/ethnicity and poverty, which are linked determinants of health status, is presented in Chapter 6.

Enrollment Rates
Medicaid Eligible Children under Three Born to Washington Mothers and National Prevalence Rates*
Children under Three in the NHIS with Incomes at or below 200% FPL

	Dec.1, 1993	May 1, 1995	Dec. 1, 1995	May 1, 1996
Enrolled, Medicaid Eligible	2,368	2,525	2,052	1,822
Washington Births, Medicaid Eligible	100,337	93,143	73,141	58,771
Enrollment Rate, Med. Eligible	2.4%	2.7%	2.8%	3.1%
National Prev. Rate (≤ 200% FPL)	2.3%	2.4%	2.7%	2.9%
White				
Washington Births, Medicaid Eligible	2.6%	3.0%	2.9%	3.3%
National Prev. Rate (≤ 200% FPL)	2.2%	2.3%	2.5%	2.6%
Hispanic				
Washington Births, Medicaid Eligible	1.6%	1.9%	2.2%	2.2%
National Prev. Rate (≤ 200% FPL)	1.8%	1.7%	2.1%	2.2%
Asian / Pacific Islander				
Washington Births, Medicaid Eligible	1.4%	1.6%	1.5%	1.6%
National Prev. Rate (≤ 200% FPL)	0.4%	1.3%	2.0%	2.5%
African American				
Washington Births, Medicaid Eligible	2.3%	2.4%	3.2%	3.8%
National Prev. Rate (≤ 200% FPL)	3.0%	3.5%	3.8%	4.0%
Native American				
Washington Births, Medicaid Eligible	3.2%	3.8%	4.4%	4.7%
National Prev. Rate (≤ 200% FPL)	0.5%	3.2%	3.6%	5.2%
Other / Unknown				
Washington Births, Medicaid Eligible	2.5%	2.8%	3.3%	3.7%
National Prev. Rate (≤ 200% FPL)	0.0%	0.0%	0.0%	0.0%

**See Appendix C for corresponding NHIS years.*

- Among Medicaid eligible children in Washington, enrollment rates for Whites, Asian/Pacific Islanders, and Native Americans were greater in 1993 than NHIS prevalence rates. By 1996 enrollment rates for Whites continued to exceed the national prevalence rates. Enrollment rates for Asian/Pacific Islanders and Native American children were lower in 1996 than the national prevalence rates with percent differences of 36% and 9.6% respectively. In 1993, enrollment rates for Hispanic and African American children were lower than the national prevalence rates. By 1996 enrollment rates had increased so that the enrollment rate for Hispanics was the same as the NHIS prevalence rate and for African Americans somewhat lower.

Enrollment Rates
Non-Medicaid Eligible Children under Three Born to Washington Mothers and National Prevalence Rates*
Children under Three in the NHIS with Incomes above 200% FPL

	Dec.1, 1993	May 1, 1995	Dec. 1, 1995	May 1, 1996
Enrolled, Non-Medicaid Eligible	1,029	1,075	893	783
Washington Births, Non-Med. Elig.	136,765	115,323	88,516	70,894
Enrollment Rate, Non-Med. Elig.	0.8%	0.9%	1.0%	1.1%
National Prev. Rate (> 200% FPL)	1.5%	1.5%	1.5%	1.4%
White				
Enrollment Rate, Non-Med. Elig.	0.8%	1.0%	1.0%	1.1%
National Prev. Rate (> 200% FPL)	1.4%	1.6%	1.5%	1.3%
Hispanic				
Enrollment Rate, Non-Med. Elig.	0.7%	1.2%	1.4%	1.6%
National Prev. Rate (> 200% FPL)	1.2%	1.3%	1.3%	1.3%
Asian / Pacific Islander				
Enrollment Rate, Non-Med. Elig.	0.5%	0.5%	0.8%	0.8%
National Prev. Rate (> 200% FPL)	0.5%	0.9%	0.7%	0.7%
African American				
Enrollment Rate, Non-Med. Elig.	0.7%	0.8%	0.5%	0.7%
National Prev. Rate (> 200% FPL)	2.4%	1.4%	2.0%	2.5%
Native American				
Enrollment Rate, Non-Med. Elig.	1.1%	1.1%	1.5%	2.2%
National Prev. Rate (> 200% FPL)	1.8%	3.3%	2.0%	2.8%
Other / Unknown				
Enrollment Rate, Non-Med. Elig.	0.6%	0.7%	0.7%	0.9%
National Prev. Rate (> 200% FPL)	0.0%	0.0%	0.0%	0.0%

**See Appendix C for corresponding NHIS years.*

- Among Non-Medicaid Eligible children and NHIS children with incomes greater than 200%, Washington enrollment rates for Whites, Hispanics, African Americans, and Native Americans were lower in 1993 than NHIS national prevalence rates. By 1996 Washington rates had increased so rates were more comparable to the national prevalence rates for Whites, Hispanics, and Native Americans. Enrollment rates for African Americans remained lower than the national prevalence rates. Washington enrollment rates for Hispanics and Asian/Pacific Islanders exceeded the NHIS prevalence rates.

- The enrollment rate for Medicaid eligible children (2.4% – 3.1%) was greater than for Non-Medicaid children (0.8% – 1.1%) over the four counts.

- Similarly, the national prevalence rate of reported limitations for children in lower income families (2.3% – 2.9%) was greater than for children in families with incomes greater than 200% FPL (1.4% – 1.5%).

CHAPTER 5

COUNTY ENROLLMENT RATES

Washington State includes a diverse collection of geographic areas. Varying economic, demographic, and programmatic conditions have resulted in differences across Washington in the need for and delivery of publicly funded early intervention services. This chapter presents patterns and trends in early intervention enrollment for each of the 39 counties in Washington State, showing the extent of geographic variation.

In addition to considering each county separately, this chapter also groups Washington's counties into three categories based on population density. *Metropolitan* counties have the largest and most concentrated populations. *Small urban* counties have smaller, although still concentrated populations. *Rural* counties have the smallest populations and no large population centers. Summary enrollment figures are presented for these categories.

Because county of residence was assigned only for children matched with the FSDB, analysis of enrollment by county was limited to children born in 1994 or earlier. *County of residence* is the mother's residence at time of birth. Children may or may not be enrolled with providers in their county of residence.

Enrollment by county and county groups is shown for all children born to Washington mothers and for Medicaid eligible children born to Washington mothers. Poverty is associated with an increased risk of developmental delay and disability. (*Please see* ENVIRONMENTAL RISK FACTORS *in* CHAPTER 6: RISK FACTORS.) Analyzing enrollment for Medicaid eligible children across counties compares populations with similar poverty profiles, reducing the impact of differences in socioeconomic status on enrollment rates. Geographic variations in Medicaid eligible enrollment rates are more likely to reflect differences among counties not related to income.

PATTERNS AND TRENDS

The table on the following page displays enrollment figures by county and county group for children enrolled in early intervention programs on May 1, 1996.

The columns labeled *Index* compare a county or county group enrollment rate with the overall enrollment rate for Washington State. The index is calculated by dividing a county or county group enrollment rate by the State Total enrollment rate. An index of 1.00 indicates that a county group has the same enrollment rate as Washington State on the whole. An index of less than 1.00 indicates an enrollment rate that is lower than the state rate, and an index greater than 1.00 indicates an enrollment rate that is higher.

For all births, the rural and small urban groups have enrollment rates, 2.7% and 2.2%, respectively, that are higher than the Washington State total (2.0%). The indices for the metropolitan (0.90), small urban (1.10), and rural (1.33) groups indicate that children tend to be enrolled at a higher rate in more rural counties.

Much of the difference between the county groups is associated with a higher incidence of poverty in rural areas. Approximately 39% (32,094 ÷ 82,819) of all children born in urban counties were Medicaid eligible, while 55% (17,243 ÷ 31,532) of small urban and 62% (32,094 ÷ 82,819) of rural children were Medicaid eligible.

When Medicaid eligible children are considered separately, the differences in enrollment rates are smaller. Enrollment rates for Medicaid eligible children were the same (3.0%) for the metropolitan and small urban groups. The enrollment rate for the rural group (3.5%) continued to be somewhat higher than that for the state as a whole (3.1%). However, the lower index for the rural Medicaid eligible group, 1.14 compared to 1.33 for all rural births, suggests that differences between rural and urban counties are less pronounced when groups with similar income levels are compared.

Higher enrollment rates in rural counties are consistent with apparent programmatic differences that exist between areas with high and low population densities. Families living in urban areas tend to have more options for early intervention services not funded by state agencies. For example, more children in urban areas can receive early intervention services through private non-profit providers.

Variation in enrollment rates for Medicaid eligible children across individual counties may reflect the interaction of a number of factors. Among these factors are differences in the extent and administration of managed care for Medicaid recipients, in funding streams for early intervention services, and in contracting for child find activities.

Enrollment on May 1, 1996, by County of Residence
All Children and Medicaid Eligible Children
Born to Washington Mothers May 1, 1993, to December 31, 1994

	Medicaid				All Births			
County	Enrolled Births	WA Births	Enroll. Rate	Index	Enrolled Births	WA Births	Enroll. Rate	Index
Clark	60	2,832	2.1%	0.68	111	7,124	1.6%	0.78
King	387	13,277	2.9%	0.94	589	36,976	1.6%	0.79
Pierce	205	6,903	3.0%	0.96	296	16,400	1.8%	0.90
Snohomish	138	4,580	3.0%	0.97	255	13,109	1.9%	0.97
Spokane	178	4,502	4.0%	1.28	246	9,210	2.7%	1.33
Metro Total	**968**	**32,094**	**3.0%**	**0.97**	**1,497**	**82,819**	**1.8%**	**0.90**
Benton	47	1,504	3.1%	1.01	72	3,276	2.2%	1.09
Cowlitz	59	1,157	5.1%	1.64	75	2,025	3.7%	1.84
Franklin	53	1,255	4.2%	1.36	59	1,693	3.5%	1.73
Kitsap	59	1,824	3.2%	1.04	100	5,365	1.9%	0.93
Lewis	50	906	5.5%	1.78	56	1,411	4.0%	1.98
Skagit	33	1,146	2.9%	0.93	47	2,127	2.2%	1.10
Thurston	44	1,772	2.5%	0.80	71	4,099	1.7%	0.86
Walla Walla	27	740	3.6%	1.18	36	1,167	3.1%	1.54
Whatcom	44	1,413	3.1%	1.00	68	3,189	2.1%	1.06
Yakima	105	5,526	1.9%	0.61	114	7,180	1.6%	0.79
S.U. Total	**521**	**17,243**	**3.0%**	**0.97**	**698**	**31,532**	**2.2%**	**1.10**
Adams	6	395	1.5%	0.49	7	510	1.4%	0.68
Asotin	13	265	4.9%	1.58	15	410	3.7%	1.82
Chelan	36	1,167	3.1%	1.00	39	1,653	2.4%	1.17
Clallam	29	639	4.5%	1.46	36	1,087	3.3%	1.65
Columbia	0	44	0.0%	0.00	0	72	0.0%	0.00
Douglas	17	498	3.4%	1.10	18	762	2.4%	1.18
Ferry	0	102	0.0%	0.00	1	136	0.7%	0.37
Garfield	0	19	0.0%	0.00	0	28	0.0%	0.00
Grant	36	1,355	2.7%	0.86	46	1,940	2.4%	1.18
Grays Harbor	59	972	6.1%	1.96	67	1,420	4.7%	2.35
Island	16	465	3.4%	1.11	30	1,675	1.8%	0.89
Jefferson	23	230	10.0%	3.23	27	360	7.5%	3.73
Kittitas	5	263	1.9%	0.61	6	498	1.2%	0.60
Klickitat	3	268	1.1%	0.36	7	381	1.8%	0.91
Lincoln	2	81	2.5%	0.80	2	185	1.1%	0.54
Mason	27	511	5.3%	1.70	35	863	4.1%	2.02
Okanogan	24	768	3.1%	1.01	25	952	2.6%	1.31
Pacific	8	259	3.1%	1.00	8	379	2.1%	1.05
Pend Oreille	8	162	4.9%	1.59	9	228	3.9%	1.96
San Juan	2	90	2.2%	0.72	4	180	2.2%	1.11
Skamania	2	86	2.3%	0.75	3	149	2.0%	1.00
Stevens	11	465	2.4%	0.76	15	701	2.1%	1.07
Wahkiakum	0	38	0.0%	0.00	1	62	1.6%	0.80
Whitman	5	290	1.7%	0.56	8	676	1.2%	0.59
Rural Total	**332**	**9,432**	**3.5%**	**1.14**	**409**	**15,307**	**2.7%**	**1.33**
State Total*	**1,822**	**58,771**	**3.1%**	**1.00**	**2,605**	**129,665**	**2.0%**	**1.00**

* *Some children could not be assigned a county of residence. As a result, state totals may be slightly higher than the sums of counties.*

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The table on the following page displays early intervention enrollment across the four counts by county and county group. Caution should be used in comparing enrollment rates across counts for two reasons. (*Please refer to* LIMITATIONS *in* CHAPTER 2: METHODS *for more information*).

First, because county of residence was assigned using information from birth certificates, analysis of enrollment by county was limited to children with records in the FSDB. Birth certificates are available in the FSDB for births in 1994 or earlier. Children born after 1994, reported in the three counts conducted in 1995 and 1996, could not be included in the calculation of enrollment rates. As a result, enrollment rates are overstated for the last three counts with the overstatement being greater the later the count.

Second, changes in the DOH/CFH database maintained by DOH/CSHCN had a varying impact on different counts. Enrolled children were over reported in records collected from the DOH/CFH database for the May 1, 1996, count. As a result, enrollment rates for the May 1, 1996, count are overstated.

(*Please refer to* APPENDIX D: COUNTY ENROLLMENT DETAIL *for raw figures used to calculate enrollment rates by county for the first three counts.*)

It is to be expected that counties will demonstrate differences in early intervention enrollment trends. The effect of various conditions on enrollment rates differs across counties.

- Enrollment rates for counties with small populations often shift dramatically. Given the relatively low number of births in small counties, slight changes in enrollment translate into large changes in enrollment rates.

- Programmatic changes implemented in individual counties can cause enrollment rates to fluctuate. Examples of programmatic change include implementation of managed care for Medicaid recipients, changes in funding streams for early intervention services, and changes in contracting for child find activities.

- Population shifts can have an impact on county enrollment rates. If enrolled children leaving their county of birth also end their enrollment in state funded early intervention programs, the enrollment rate for that county will decline.

Enrollment Rates Across Counts by County of Residence
All Children and Medicaid Eligible Children Under Three
Born to Washington Mothers*

County	Medicaid				All Births			
	Dec 1, 1993	May 1, 1995	Dec 1, 1995	May 1, 1996	Dec 1, 1993	May 1, 1995	Dec 1, 1995	May 1, 1996
Clark	1.9%	2.0%	2.2%	2.1%	1.1%	1.3%	1.4%	1.6%
King	2.2%	2.3%	2.7%	2.9%	1.1%	1.3%	1.4%	1.6%
Pierce	1.8%	2.3%	2.7%	3.0%	1.1%	1.4%	1.7%	1.8%
Snohomish	3.0%	3.0%	2.9%	3.0%	1.6%	1.8%	1.9%	1.9%
Spokane	2.2%	3.0%	3.4%	4.0%	1.4%	2.0%	2.2%	2.7%
Metro Total	**2.2%**	**2.5%**	**2.8%**	**3.0%**	**1.2%**	**1.5%**	**1.6%**	**1.8%**
Benton	2.1%	2.5%	3.4%	3.1%	1.5%	1.9%	2.4%	2.2%
Cowlitz	3.7%	4.9%	4.2%	5.1%	2.3%	3.1%	3.0%	3.7%
Franklin	1.7%	2.7%	3.3%	4.2%	1.7%	2.8%	3.0%	3.5%
Kitsap	1.9%	2.2%	1.5%	3.2%	1.2%	1.3%	1.1%	1.9%
Lewis	4.7%	6.6%	5.1%	5.5%	3.5%	4.9%	3.6%	4.0%
Skagit	1.1%	1.9%	2.5%	2.9%	0.6%	1.3%	2.1%	2.2%
Thurston	2.1%	2.7%	2.4%	2.5%	1.3%	1.6%	1.7%	1.7%
Walla Walla	2.8%	2.8%	3.0%	3.6%	2.0%	2.5%	2.7%	3.1%
Whatcom	2.4%	3.4%	2.9%	3.1%	1.6%	2.5%	2.0%	2.1%
Yakima	1.9%	2.1%	1.7%	1.9%	1.6%	1.8%	1.5%	1.6%
S.U. Total	**2.2%**	**2.8%**	**2.6%**	**3.0%**	**1.6%**	**2.0%**	**1.9%**	**2.2%**
Adams	1.3%	1.5%	1.8%	1.5%	1.1%	1.2%	1.5%	1.4%
Asotin	5.4%	6.0%	4.6%	4.9%	3.9%	4.0%	3.5%	3.7%
Chelan	2.7%	3.1%	2.9%	3.1%	2.1%	2.4%	2.2%	2.4%
Clallam	3.9%	3.2%	4.6%	4.5%	2.6%	2.7%	3.4%	3.3%
Columbia	6.2%	2.4%	3.3%	0.0%	4.8%	1.6%	2.1%	0.0%
Douglas	1.5%	2.3%	2.6%	3.4%	1.2%	1.5%	1.8%	2.4%
Ferry	3.0%	0.6%	0.0%	0.0%	2.0%	0.9%	0.6%	0.7%
Garfield	0.0%	3.1%	4.0%	0.0%	0.0%	2.0%	2.8%	0.0%
Grant	2.1%	2.5%	2.5%	2.7%	1.6%	2.1%	2.2%	2.4%
Grays Harbor	7.1%	7.1%	5.8%	6.1%	5.3%	5.4%	4.5%	4.7%
Island	2.9%	2.9%	3.1%	3.4%	1.4%	1.5%	1.7%	1.8%
Jefferson	5.0%	6.1%	6.8%	10.0%	3.5%	5.2%	5.3%	7.5%
Kittitas	2.6%	2.2%	1.2%	1.9%	1.6%	1.4%	0.7%	1.2%
Klickitat	1.0%	1.2%	1.5%	1.1%	0.8%	1.1%	1.9%	1.8%
Lincoln	4.4%	5.7%	2.9%	2.5%	2.6%	3.4%	1.3%	1.1%
Mason	2.6%	4.2%	4.0%	5.3%	2.0%	3.0%	3.0%	4.1%
Okanogan	3.2%	3.4%	3.8%	3.1%	2.7%	2.9%	3.2%	2.6%
Pacific	4.1%	4.3%	3.4%	3.1%	3.0%	3.1%	2.3%	2.1%
Pend Oreille	1.8%	1.6%	4.0%	4.9%	1.7%	1.1%	3.2%	3.9%
San Juan	1.3%	0.7%	1.8%	2.2%	0.9%	1.1%	2.3%	2.2%
Skamania	2.4%	2.3%	2.9%	2.3%	2.0%	1.8%	2.2%	2.0%
Stevens	2.5%	2.7%	2.8%	2.4%	1.9%	2.2%	2.2%	2.1%
Wahkiakum	2.3%	0.0%	0.0%	0.0%	2.1%	1.1%	2.8%	1.6%
Whitman	2.0%	1.8%	1.6%	1.7%	1.1%	1.1%	1.2%	1.2%
Rural Total	**3.2%**	**3.4%**	**3.3%**	**3.5%**	**2.3%**	**2.5%**	**2.5%**	**2.7%**
State Total	**2.4%**	**2.7%**	**2.8%**	**3.1%**	**1.4%**	**1.7%**	**1.8%**	**2.0%**

* *Enrollment rates are not comparable across counts. Please refer to the narrative accompanying this table for further explanation.*

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CHAPTER 6

RISK FACTORS

Tjossem's (1976) framework for risk factors that may lead to developmental delay and disability includes three categories of risk: established, biological and environmental. These categories are not mutually exclusive. **Established risk** conditions include genetic and biomedical causes of developmental delay and disability, such as chromosomal disorders, inborn errors of metabolism, congenital malformations, neural tube defects, congenital infections, sensory loss and injuries that result in disability and/or developmental delay. **Biological risk** conditions include prematurity, low birthweight, prenatal drug exposure or serious illness. In these conditions an insult to the central nervous system is suggested by a history of complications in prenatal, perinatal, neonatal or early development. **Environmental risks** include conditions in the infant or toddler's life that interfere with healthy development such as inadequate nutrition, neglect, physical or psychological abuse. Poverty is believed to be one of the major environmental risks in the United States today (Hanson and Lynch, 1995).

This chapter examines risk factors and enrollment of children under the age of three with delaying or disabling conditions in public early intervention programs. The First Steps Database (FSDB) was used to analyze biological and environmental risk conditions. The analysis group for this chapter is *Enrolled Washington Births*, summed across the four counts. Enrollment rates for children with established risk conditions are examined in Chapter 7 of this report.

BIOLOGICAL RISK FACTORS

Infant characteristics at birth and maternal prenatal high-risk behaviors may put the infant at risk for a variety of conditions associated with poor developmental outcome (Hanson and Lynch, 1995). The following tables present analyses which depict the relationship of enrollment in early intervention programs to these risk conditions.

Infant Characteristics at Birth

Infant characteristics at birth that may be associated with enrollment in early intervention services include low birthweight, prematurity, Apgar score less than 8, and male gender.

Infant Characteristics at Birth

Risk Factor	Enrolled Children (N = 7,354)	(100 %)	All Washington Births (N = 320,243)	(100 %)	Enrollment Rate (2.3%)
Birthweight					
Very Low (< 3.3 lbs)	452	6.1%	2,072	0.6%	21.8%
Medium Low (3.3 - 5.5 lbs)	869	11.8%	11,230	3.5%	7.7%
Normal (> 5.5 lbs)	5,534	75.3%	299,418	93.5%	1.8%
Mult. Gestation (Twins, etc.)	459	6.2%	7,045	2.2%	6.5%
Unknown Birthweight	40	0.5%	478	0.1%	8.4%
Gestational Age at Birth					
Extreme Preterm (< 28 wks)	266	3.6%	1,379	0.4%	19.3%
Mod. Preterm (28 - 36 wks)	1,865	25.4%	37,009	11.6%	5.0%
Full Term (37+ wks)	5,196	70.7%	280,668	87.6%	1.9%
Unknown	27	0.4%	1,187	0.4%	2.3%
Apgar Score					
less than 8	967	13.1%	9,980	3.1%	9.7%
8	1,164	15.8%	28,885	9.0%	4.0%
9	4,632	63.0%	253,871	79.3%	1.8%
10	493	6.7%	26,011	8.1%	1.9%
Unknown	98	1.3%	1,496	0.5%	6.6%
Gender					
Female	3,034	41.3%	156,131	48.8%	1.9%
Male	4,320	58.7%	164,110	51.2%	2.6%
Unknown	0	0.0%	2	0.0%	0.0%

Low Birthweight

Birthweight is a primary indicator of the health of the newborn infant. Low birthweight is associated with increased risk of death and a wide range of disorders, including neuro-developmental conditions, learning disorders, behavior problems, and lower respiratory tract infections (*Healthy People 2000*, 1991).

- The enrollment rate for very low birthweight infants (21.8%) was over twelve times higher than that for normal birthweight (singleton) infants (1.8%).
- The enrollment rates for medium low birthweight infants (7.7%) and infants from multiple gestations (6.5%) were more than three times higher than the enrollment rate for normal birthweight (singleton) children (1.8%).
- Low birthweight infants (very low and medium low birthweight combined) had an enrollment rate (9.9%) more than five times higher than that for normal birthweight (singleton) infants (1.8%).

Gestational Age

The gestational age of a newborn infant is a measure of the maturity of the newborn at delivery. Infants with a gestational age of 37 weeks or greater are considered full-term. Infants with a gestational age of less than 37 weeks are considered premature. Preterm delivery is a major cause of low birthweight.

- Preterm infants had an enrollment rate (5.6%) almost three times that for full term infants (1.9%).

- The enrollment rate for extremely preterm infants (19.3%) was over ten times higher than that for full term infants (1.9%)

Apgar Score

The Apgar score rates the overall health of an infant. The Apgar score uses a scale of 1 to 10, with 10 indicating optimum health status. The Apgar score determined at five minutes postpartum was used for this analysis. In a research study examining the relationship between biologic risk factors and environmental variables, Apgar scores below 8 were associated with significantly poorer cognitive performance in the control group; however, children with Apgar scores below 8 in the educationally treated group did not show this poor cognitive performance (Breitmayer and Ramey, 1986).

- The enrollment rate for children with an Apgar score of less than 8 (9.7%) was almost five times higher than that for children with an Apgar score of 8 or more (2.0%).

Gender

Previous studies have shown that males were more prone to developmental difficulties (Rojahn et al., 1995) and more likely to be placed in special education programs than females (Andrews et al., 1995).

Male children had a higher enrollment rate (2.6%) than females (1.9%).

Prenatal Care and Maternal Behaviors

Inadequate prenatal care, smoking and substance abuse may also be associated with enrollment in early intervention services.

Prenatal Care and Smoking Status

Risk Factor	Enrolled Children (N = 7,354)	(100 %)	All Washington Births (N = 320,243)	(100 %)	Enrollment Rate (2.3%)
Trimester Prenatal Care Began					
No Prenatal Care	123	1.7%	1,829	0.6%	6.7%
1st Trimester	5,157	70.1%	245,325	76.6%	2.1%
2nd Trimester	1,321	18.0%	47,808	14.9%	2.8%
3rd Trimester	249	3.4%	9,481	3.0%	2.6%
Unknown	504	6.9%	15,800	4.9%	3.2%
Adequacy of Prenatal Care					
Adequate Plus	2,154	29.3%	69,955	21.8%	3.1%
Adequate	2,788	37.9%	154,435	48.2%	1.8%
Intermediate	1,218	16.6%	58,517	18.3%	2.1%
Inadequate	280	3.8%	8,773	2.7%	3.2%
Unknown	914	12.4%	28,563	8.9%	3.2%
Mother Smoked During Pregnancy					
Yes	2,007	27.3%	56,498	17.6%	3.6%
No	4,960	67.4%	248,346	77.5%	2.0%
Unknown	387	5.3%	15,399	4.8%	2.5%

Prenatal Care

Prenatal care is measured in terms of both timing (the trimester in which prenatal care began) and adequacy (the frequency of prenatal care visits). This report uses Kotelchuck's Adequacy of Received Services Index (Kotelchuck, 1994), which compares the frequency of prenatal visits to recommendations by the American College of Obstetricians and Gynecologists, as a measure of the adequacy of prenatal care. Prenatal care is considered inadequate if the mother has fewer than 50% of the recommended number of prenatal care visits during the period between the first visit and delivery.

- The enrollment rate for children of mothers who did not receive prenatal care (6.7%) was over three times higher than that for children of mothers who received prenatal care in the first trimester (2.1%).

- The enrollment rate for children of mothers with inadequate prenatal care (3.2%) was nearly twice that for children of mothers who received adequate prenatal care (1.8%). (Note: adequate plus prenatal care had a high enrollment rate (3.1%), as relatively high risk pregnancies (e.g., multiple gestation, premature birth) tend to receive a greater amount of care.)

Smoking Status

Smoking during pregnancy is the single most important preventable cause of low birthweight (Mullen, 1990).

- The enrollment rate for children born to women who smoked during pregnancy (3.6%) was nearly twice that for children born to nonsmoking women (2.0%).

Diagnosed Maternal Substance Abuse among Medicaid Served Women

Risk Factor	Enrolled Children (N = 4,517)	(100 %)	All Medicaid Births (N = 125,563)	(100 %)	Enrollment Rate (3.6%)
Diagnosed Substance Abuse					
Alcohol Only	*154*	*3.4%*	*2,302*	*1.8%*	*6.7%*
Drugs Only	*333*	*7.4%*	*4,107*	*3.3%*	*8.1%*
Both Alcohol and Drugs	*308*	*6.8%*	*2,306*	*1.8%*	*13.4%*
Any Substance Abuse	795	17.6%	8,715	6.9%	9.1%
No Substance Abuse	3,722	82.4%	116,848	93.1%	3.2%

Substance Abuse

The abuse of alcohol or drugs during pregnancy endangers infant and maternal health. It is associated with low birthweight, infant mortality, developmental delay, and medical complications (Jones and Lopez, 1990).

The First Steps Database uses diagnoses on Medicaid claims to identify maternal substance abuse. As a result, analysis of maternal substance abuse in this report is limited to children whose mothers received Medicaid paid maternity services. This is a unique group within the context of the report because these children have family incomes equal to or less than 185% FPL, which is a subgroup of the children with family incomes equal to or less than 200% FPL.

- For Medicaid served mothers, the enrollment rate for children born to women with any diagnosed substance abuse (9.1%) was almost three times higher than that for children born to women without diagnosed substance abuse (3.2%).

For Medicaid served mothers, the enrollment rate for children born to women diagnosed as both drug and alcohol abusers (13.4%) was over four times higher than that for children born to women not diagnosed as substance abusers (3.2%).

ENVIRONMENTAL RISK FACTORS

Adverse socio-environmental conditions can put a biologically sound infant at increased risk of developmental delay and eventual school failure (Bennett, 1991). The individual environmental risk variables most often cited are poverty (Children's Defense Fund, 1994), maternal education, maternal age, and caregiving practices (King et al., 1992). The combination of biologic and environmental predictors as a powerful tool in predicting developmental outcome has been emphasized by a number of authors (Hanson and Lynch, 1995; King et al., 1992; Rojahn et al., 1995). Sameroff and Chandler (1975) point to the powerful effects of the environment, especially the caregiving environment, in compensating for, or negatively interacting with, other risk conditions, such as biological risk conditions.

The following tables examine the relationship of enrollment in early intervention programs to selected environmental risk conditions including maternal age, marital status, maternal education, number of prior births, income status, and race/ethnicity by income status.

Maternal Demographic Characteristics

Maternal Age

One of the environmental risks frequently cited as having value in predicting developmental outcome is maternal age (King et al., 1992).

- Children of women who were younger than 15 years old at the time of delivery had an enrollment rate (5.1%) more than twice that of all children born to Washington mothers (2.3%). The enrollment rates for children of women 15 – 19 years (3.1%) and older than 39 years (3.0%) were also higher than for all children born to Washington mothers.

Marital Status

- The enrollment rate for children of unmarried mothers (3.4%) was nearly twice the rate for children of married mothers (1.9%).

Maternal Education

Maternal education is one of the variables most often cited as having a predictive value for poor developmental outcome (Bee et al., 1982; King et al., 1992; Kochanek et al., 1987; Ramey et al., 1978).

- Children of mothers who completed 8 – 11 years of school had an enrollment rate (4.1%) almost twice that of those whose mothers graduated from high school and had no further education (2.6%).

- The enrollment rate for children of mothers who completed 8 – 11 years of school (4.1%) was nearly three times the rate for children of mothers who were college graduates (1.5%).

Maternal Demographic Characteristics

Risk Factor	Enrolled Children (N = 7,354)	(100 %)	All Washington Births (N = 320,243)	(100 %)	Enrollment Rate (2.3%)
Age					
< 15 Years Old	30	0.4%	585	0.2%	5.1%
15 - 19 Years Old	1,049	14.3%	34,228	10.7%	3.1%
20 - 29 Years Old	3,996	54.3%	174,503	54.5%	2.3%
30 - 39 Years Old	2,102	28.6%	105,082	32.8%	2.0%
40 + Years Old	170	2.3%	5,617	1.8%	3.0%
Unknown	7	0.1%	228	0.1%	3.1%
Marital Status					
Married	4,542	61.8%	238,460	74.5%	1.9%
Single	2,783	37.8%	81,132	25.3%	3.4%
Unknown	29	0.4%	651	0.2%	4.5%
Educational Attainment *					
< 8 years	227	3.9%	7,772	3.3%	2.9%
8 - 11 years	1,256	21.6%	30,353	13.0%	4.1%
12 years	1,922	33.1%	73,445	31.4%	2.6%
13 - 15 years	1,114	19.2%	53,804	23.0%	2.1%
16+ years	653	11.2%	44,587	19.1%	1.5%
Unknown	642	11.0%	23,934	10.2%	2.7%
Number of Prior Births					
None	2,640	35.9%	131,414	41.0%	2.0%
1 Child	2,257	30.7%	101,956	31.8%	2.2%
2 Children	1,208	16.4%	49,271	15.4%	2.5%
3 - 5 Children	1,023	13.9%	29,786	9.3%	3.4%
6 + Children	116	1.6%	2,953	0.9%	3.9%
Unknown	110	1.5%	4,863	1.5%	2.3%
Medicaid Eligibility **					
Grant Recipient	2,372	32.3%	56,807	17.7%	4.2%
Pre-First Steps Medicaid Only	1,097	14.9%	29,432	9.2%	3.7%
First Steps Expansion	1,010	13.7%	38,581	12.0%	2.6%
Served, No Elig. Record	41	0.6%	783	0.2%	5.2%
Non-Medicaid	2,834	38.5%	194,640	60.8%	1.5%

* *Information about a mother's educational attainment was included on birth certificates beginning in 1992. Percentages and enrollment rates are calculated for births in 1992 or later. (5,814 Enrolled Children, 233,895 Washington Births)*

** *The mother's Medicaid eligibility at time of birth was used as a measure of income. In general, women eligible for cash assistance had family incomes at or below 65% of the Federal Poverty Line (FPL). Pre-First Steps (FS) Medicaid only women had family incomes at or below 90% of FPL. FS Expansion women had family incomes between 90% and 185% of FPL. Some women received Medicaid paid services but did not have a Medicaid eligibility record.*

Number of Prior Births

- The enrollment rate for children of mothers with three or more prior births (3.5%) was higher than that for children of mothers with no prior births (2.0%).

Income Status

Poverty is considered a risk factor for learning disabilities and developmental disabilities in children and youth. Poverty is associated with many other risk conditions including poor health and nutrition, learning problems, greater risk of infectious diseases, accidents, and exposure to toxic environments (Children's Defense Fund, 1994). Other risks associated with living in poverty are homelessness and exposure to violent situations (Children's Defense Fund, 1994).

Maternal Medicaid Eligibility

- The enrollment rate for children of Non-Medicaid women (1.5%) was substantially lower than that for all children born in Washington (2.3%). Children of Medicaid women in the lowest income eligibility groups, grant recipients (4.2%) and pre-FS Medicaid Only (3.7%), had higher enrollment rates than all Washington children.

Race/Ethnicity and Income Level

Poverty and race/ethnicity are linked determinants of health status. A conceptual change has recently occurred in health promotion from a minority population focus to a poverty focus (Kerner et al., 1993). The first table below depicts enrollment rates with a focus on race/ethnicity only. The next two tables depict enrollment rates by race/ethnicity stratified by income level.

Race/Ethnicity for all Washington Births

	Enrolled Children		All Washington Births		Enrollment Rate
Risk Factor	(N = 7,354)	(100 %)	(N = 320,243)	(100 %)	(2.3%)
Race / Ethnicity					
White (Non-Hispanic)	5,606	76.2%	247,474	77.3%	2.3%
Hispanic	665	9.0%	27,435	8.6%	2.4%
Asian/Pacific Islander	234	3.2%	17,895	5.6%	1.3%
African American	344	4.7%	12,264	3.8%	2.8%
Native American	316	4.3%	6,709	2.1%	4.7%
Other/Unknown	189	2.6%	8,466	2.6%	2.2%

Race/Ethnicity for Medicaid Births (≤ 200% FPL)

Risk Factor	Enrolled Children (N = 5,058)	(100 %)	All Washington Births (N = 138,178)	(100 %)	Enrollment Rate (3.7%)
Race/Ethnicity					
White (Non-Hispanic)	3,581	70.8%	90,981	65.8%	3.9%
Hispanic	605	12.0%	23,157	16.8%	2.6%
Asian/Pacific Islander	148	2.9%	7,365	5.3%	2.0%
African American	303	6.0%	8,063	5.8%	3.8%
Native American	288	5.7%	5,289	3.8%	5.4%
Other/Unknown	133	2.6%	3,323	2.4%	4.0%

Race/Ethnicity for Non-Medicaid Births (> 200% FPL)

Risk Factor	Enrolled Children (N = 2,296)	(100 %)	All Washington Births (N = 182,065)	(100 %)	Enrollment Rate (1.3%)
Race/Ethnicity					
White (Non-Hispanic)	2,025	88.2%	156,493	86.0%	1.3%
Hispanic	60	2.6%	4,278	2.3%	1.4%
Asian/Pacific Islander	86	3.7%	10,530	5.8%	0.8%
African American	41	1.8%	4,201	2.3%	1.0%
Native American	28	1.2%	1,420	0.8%	2.0%
Other/Unknown	56	2.4%	5,143	2.8%	1.1%

Analysis of enrollment rates by race/ethnicity while controlling for the relative level of income portrays a different picture than focusing on racial/ethnic group alone.

- The enrollment rate for all Washington births is 2.3% with a range from 1.3% – 4.7% (-1 to +2.4) for the different race/ethnicity groups. Considering Medicaid and Non-Medicaid births separately shows different patterns in the range of enrollment rates. For Non-Medicaid births the enrollment rate is 1.3% with a narrow range from 0.8% to 2.0% (-0.5 to +0.7); the range of variation across racial/ethnic groups is less than for Medicaid. For Medicaid births, the enrollment rate is 3.7% with a wider range from 2.0% – 5.4% (-1.7 to +1.7); the rates are consistently higher for all race/ethnicity groups than for the same Non-Medicaid racial/ethnic groups.

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CHAPTER 7

MEDICAL CONDITIONS AND MEDICAID EXPENDITURES

Infants and toddlers may be affected by a range of conditions which can have varying impacts on their development. This chapter provides information about diagnosed medical conditions and early intervention program enrollment. Analysis examines the prevalence of various conditions and the relationship between medical condition and program enrollment.

International Classification of Diseases (ICD-9) diagnoses on Medicaid claims were used to categorize by medical condition Medicaid eligible children born to Washington mothers. ICD-9 diagnoses from an infant's first two years of life, available in Medicaid claims data from the First Steps Database (FSDB), were reviewed. Diagnoses were grouped into conditions and, in cases of a child with multiple conditions, assignment of conditions was prioritized based on the age at which they are expected to appear. The categorization of ICD-9 codes was developed by Laurie Cawthon, M.D., M.P.H., for the Child Development and Rehabilitation Center in Portland, Oregon. Similar methods were discussed by Palfrey, et al. (1987) and First and Palfrey (1994).

Medicaid payment data available in the FSDB were used to calculate average first year Medicaid expenditures for various groups. High medical expenditures can indicate severe conditions requiring costly medical treatment and equipment. In addition, medical expenditures reveal part of the financial cost involved in caring for children with delaying or disabling conditions.

Diagnosed medical conditions are not necessarily a basis for early intervention program eligibility. Certain conditions have been defined as qualifying children for services. However, functional assessments of developmental delay are also used to determine eligibility. Developmental delay may be directly related to a diagnosed condition, indirectly associated with a diagnosed condition (e.g., delay caused by prolonged hospitalization), or not related to a diagnosed condition.

FINDINGS: PATTERNS

This section analyzes enrollment rates and first year Medicaid expenditures by diagnosed medical condition for children reported in any of the four counts. This section provides information about the range and severity of conditions affecting Medicaid eligible children, the cost of caring for children with delaying or disabling conditions, and enrollment of children with conditions likely to result in developmental delay.

The table at right displays enrollment rates by diagnosed medical condition as well as average first year Medicaid expenditures for both children who were, and children who were not, enrolled in early intervention programs.

Enrollment rates were highest for those children diagnosed with Down syndrome (87.7%) and cerebral palsy (65.3%). Washington State defines Down syndrome and cerebral palsy as conditions with a high probability of resulting in developmental delay and sufficient to qualify a child for early intervention services under IDEA Part H. (*Please see* APPENDIX A: STATE DEFINITIONS OF DEVELOPMENTAL DELAY.)

Other conditions associated with developmental delay also showed high enrollment rates: cleft lip and/or palate (62.6%), developmental speech and language disorder (42.4%), and other developmental disorder or delay (41.1%).

Medicaid eligible children enrolled in early intervention programs were more likely to have a diagnosable medical condition than those who were not enrolled. Over 68% (3,442 ÷ 5,058) of enrolled children were classified in this scheme as having a medical condition, while only 32% (44,532 ÷ 138,178) of non-enrolled children were so classified.

The average first year Medicaid expenditure for all Washington-born children enrolled in early intervention programs ($17,293) is nearly eight times the average expenditure for children not enrolled ($2,236). With only one exception, enrolled children had a higher average expenditure for every condition. The differences suggest that children who had required extensive medical treatment were likely to be enrolled in early intervention programs.

Parents and providers suggest that Medicaid expenditures reflect only part of the costs of caring for developmentally delayed or disabled children. They indicate that the true costs can be many times what is paid by Medicaid. Medicaid generally reimburses approximately 60% of billed medical costs. The balance of medical costs may be met through private pay, private insurance, alternative payers (e.g., other state/federal/local programs, the military, Indian Health Service, Tribal Health Service), charitable grants, hospital or physician deferral, forgiveness, or non-recoverable write-offs.

Medicaid Eligible Children under Three Born to Washington Mothers: Enrollment and Average First Year Medical Expenditure by Diagnosed Condition Summed across Four Counts.

Condition	WA Births	Avg. 1st Yr. Med. Exp.*	Enroll. Births	Enroll. Rate	Avg. 1st Yr. Med. Exp.
Down Syndrome	155	$ 19,304	136	87.7%	$ 23,754
Cleft Lip and/or Palate	214	$ 8,235	134	62.6%	$ 21,595
Other Congenital & Chromosomal Anomalies	908	$ 5,584	213	23.5%	$ 37,861
Congenital Musculoskeletal Deformities, Congenital Anomalies of Limbs	6,363	$ 3,773	645	10.1%	$ 30,966
Cerebral Palsy	176	$ 15,580	115	65.3%	$ 41,732
Neoplasms, Diseases & Congenital Anomalies of the Nervous System	21,390	$ 3,497	1,187	5.5%	$ 23,194
Congenital Anomalies of Heart & Circulatory System	1,638	$ 9,396	189	11.5%	$ 30,493
Endocrine, Nutritional & Metabolic Diseases, & Immunity Disorders	3,314	$ 3,683	189	5.7%	$ 12,287
Certain Conditions Originating in the Perinatal Period	9,037	$ 3,983	427	4.7%	$ 12,967
Hearing Loss, Congenital Anomalies of Ear, Face, and Neck	536	$ 2,410	62	11.6%	$ 4,848
Developmental Speech & Language Disorder	66	$ 2,648	28	42.4%	$ 6,761
Other Mental Disorders	511	$ 2,038	25	4.9%	$ 3,422
Other Developmental Disorder or Delay	224	$ 6,158	92	41.1%	$ 4,086
All Other Medicaid Eligible	93,646	$ 1,490	1,616	1.7%	$ 3,960
Medicaid Eligible Washington Births	**138,178**	**$ 2,236**	**5,058**	**3.7%**	**$ 17,293**

* *Average first year Medicaid expenditures for Washington births are calculated only for children who are NOT enrolled in early intervention programs.*

FINDINGS: TRENDS

This section reviews changes in the distribution and enrollment rates for diagnosed medical conditions among Washington births. Changes in distribution and enrollment rates are tracked across the four counts. This section provides information about trends in Medicaid diagnoses and early intervention enrollment.

Analysis in this section is presented for children who were two years old at the time of the count. Birth certificates and Medicaid claims data were available in the FSDB for children born in 1994 or earlier. As a result, children born after 1994 could not be included in the calculation of enrollment rates for the three counts in 1995 and 1996. To control for the differences among counts in the age of children with available data, children of the same age at the time of each count were compared.

The tables on the following two pages detail distribution and enrollment by condition for Medicaid eligible two year olds born to Washington mothers. The first table displays the number and proportion of all Medicaid eligible two-year-olds with the diagnosed conditions. The second table shows the number of Medicaid eligible two-year-olds with diagnosed conditions enrolled in early intervention programs and the corresponding enrollment rates.

The proportion of children diagnosed with conditions originating in the perinatal period has increased over 2.5 times (from 3.7% to 9.7%). *Certain conditions originating in the perinatal period* include such conditions as prematurity, complications in delivery, poor fetal growth, and infant reactions to maternal drug use. The increase in diagnosed perinatal conditions is somewhat unanticipated because low birthweight, which is associated with these conditions, has declined for Medicaid eligible mothers. At the time of this analysis, no specific explanation could be given for this finding. However, the increase in diagnoses may relate to changes in Medicaid provider reporting practices.

Enrollment rates increased for cerebral palsy and hearing loss. The enrollment rate for Medicaid eligible two-year-olds diagnosed with *cerebral palsy* has increased nearly 2.5 times from the first count (37.1%) to the last count (92.1%). In the May 1, 1996, count, over nine out of ten children diagnosed with cerebral palsy were enrolled in early intervention programs. As noted above, cerebral palsy has been defined by Washington State as a condition likely to result in developmental delay.

The enrollment rate for *hearing loss, congenital anomalies of the ear, face, and neck* has risen from 6.7% to 16.3% between the first and the last counts. As payer of last resort, early intervention programs have begun funding hearing aids for infants, creating an incentive to enroll children with significant hearing loss when no other public or private funding source is available.

Medicaid Eligible Two Year Olds Born to Washington Mothers
Number and Percent by Diagnosed Medical Condition*

Condition	Dec.1, 1993	May 1, 1995	Dec. 1, 1995	May 1, 1996	% Change ('93 - '96)
Down Syndrome	35	44	33	42	
	0.11%	*0.13%*	*0.09%*	*0.12%*	*6.3%*
Cleft Lip/Palate	49	48	62	55	
	0.16%	*0.14%*	*0.18%*	*0.16%*	*-0.6%*
Other Congenital & Chromosomal Anomalies	190	249	303	274	
	0.60%	*0.72%*	*0.86%*	*0.77%*	*27.7%*
Congenital Musculoskeletal Deformities, Congenital Anomalies of Limbs	1,968	1,882	1,512	1,225	
	6.26%	*5.48%*	*4.30%*	*3.45%*	*-44.9%*
Cerebral Palsy	62	44	45	38	
	0.20%	*0.13%*	*0.13%*	*0.11%*	*-45.7%*
Neoplasms, Diseases & Congenital Anomalies of the Nervous System	5,729	6,431	5,661	4,781	
	18.23%	*18.71%*	*16.08%*	*13.48%*	*-26.1%*
Congenital Anomalies of Heart & Circulatory System	331	395	428	433	
	1.05%	*1.15%*	*1.22%*	*1.22%*	*15.9%*
Endocrine, Nutritional & Metabolic Diseases, & Immunity Disorders	816	937	924	788	
	2.60%	*2.73%*	*2.63%*	*2.22%*	*-14.5%*
Certain Conditions Originating in the Perinatal Period	1,156	1,824	3,062	3,437	
	3.68%	*5.31%*	*8.70%*	*9.69%*	*163.4%*
Hearing Loss, Congenital Anomalies of Ear, Face, & Neck	150	170	118	92	
	0.48%	*0.49%*	*0.34%*	*0.26%*	*-45.7%*
Developmental Speech & Language Disorder	24	21	11	9	
	0.08%	*0.06%*	*0.03%*	*0.03%*	*-66.8%*
Other Mental Disorders	137	159	113	93	
	0.44%	*0.46%*	*0.32%*	*0.26%*	*-39.9%*
Other Developmental Disorder or Delay	50	61	53	49	
	0.16%	*0.18%*	*0.15%*	*0.14%*	*-13.2%*
All Other Medicaid Eligible	20,731	22,107	22,875	24,163	
	65.96%	*64.32%*	*64.99%*	*68.11%*	*3.2%*
Medicaid Eligible Washington Births, Age 2	**31,428**	**34,372**	**35,200**	**35,479**	
	100%	***100%***	***100%***	***100%***	

* *At the time of this analysis, Medicaid claims submitted during the second year of life for children born in 1993 and 1994 had not been fully entered in the FSDB. As a result, the prevalence of diagnosed medical conditions may be underreported for later counts.*

Medicaid Eligible Two Year Olds Born to Washington Mothers: Number Enrolled in Early Intervention Programs and Enrollment Rates by Diagnosed Medical Condition

Condition	Dec.1, 1993	May 1, 1995*	Dec. 1, 1995	May 1, 1996	% Change ('93 - '96)
Down Syndrome	31	39	26	35	
	88.6%	*88.6%*	*78.8%*	*83.3%*	*-5.9%*
Cleft Lip/Palate	23	30	31	29	
	46.9%	*62.5%*	*50.0%*	*52.7%*	*12.3%*
Other Congenital & Chromosomal	41	63	39	48	
Anomalies	*21.6%*	*25.3%*	*12.9%*	*17.5%*	*-18.8%*
Congenital Musculoskeletal Deformities,	140	196	142	130	
Congenital Anomalies of Limbs	*7.1%*	*10.4%*	*9.4%*	*10.6%*	*49.2%*
Cerebral Palsy	23	34	38	35	
	37.1%	*77.3%*	*84.4%*	*92.1%*	*148.3%*
Neoplasms, Diseases & Congenital	229	350	275	251	
Anomalies of the Nervous System	*4.0%*	*5.4%*	*4.9%*	*5.2%*	*31.3%*
Congenital Anomalies of Heart &	28	52	20	37	
Circulatory System	*8.5%*	*13.2%*	*4.7%*	*8.5%*	*1.0%*
Endocrine, Nutritional & Metabolic	32	60	51	43	
Diseases, & Immunity Disorders	*3.9%*	*6.4%*	*5.5%*	*5.5%*	*39.1%*
Certain Conditions Originating	35	93	109	128	
in the Perinatal Period	*3.0%*	*5.1%*	*3.6%*	*3.7%*	*23.0%*
Hearing Loss, Congenital Anomalies	10	17	10	15	
of Ear, Face, & Neck	*6.7%*	*10.0%*	*8.5%*	*16.3%*	*144.6%*
Developmental Speech &	8	13	5	2	
Language Disorder	*33.3%*	*61.9%*	*45.5%*	*22.2%*	*-33.3%*
Other Mental Disorders	6	8	4	6	
	4.4%	*5.0%*	*3.5%*	*6.5%*	*47.3%*
Other Developmental Disorder	16	19	17	16	
or Delay	*32.0%*	*31.1%*	*32.1%*	*32.7%*	*2.0%*
All Other Medicaid Eligible	314	379	371	427	
	1.5%	*1.7%*	*1.6%*	*1.8%*	*16.7%*
Enrolled Medicaid Eligible	**936**	**1,353**	**1,138**	**1,202**	
Washington Births, Age 2	***3.0%***	***3.9%***	***3.2%***	***3.4%***	***13.8%***

* *Changes in the DOH/CFH database maintained by DOH/CSHCN caused enrollment for the May 1, 1995, count to be over reported. In general, when enrollment rates were controlled for the impact of database changes the May 1, 1995, rates were lower than the December 1, 1995, rates.*

CHAPTER 8

SUMMARY

This report has compiled data for four counts of children enrolled in publicly-funded early intervention programs in Washington State from December 1, 1993, to May 1, 1996. The Washington State enrollment rate has been generally stable over this time period, with a modest increase from a rate of 1.65% at the first count to 1.79% at the fourth count. The proportions of children served by two of the service providers—DDD (54% – 57%) and DOH (58% – 64%)— have remained fairly stable. Notable increases in the proportion of children served by FRCs— from 2.8% to 49.5%—occurred from the first to the fourth count due to increased and more coordinated child find and full implementation of IDEA, Part H. In addition, OSPI enrollment for the December 1993 count appears to have been understated, as the proportion of children served by OSPI increased from 17.7% at the first count to 26% – 30% at the subsequent counts.

The national prevalence rate estimated from the NHIS (1.8% – 2.1%, whether adjusted for Washington State poverty levels or not) has been consistently higher than the Washington State enrollment rate. This may be explained by the observation that not all eligible children are enrolled in publicly-funded early intervention programs. As well, Washington State enrollment rates and national prevalence rates from the NHIS are higher for older children.

The enrollment rate (2.4% – 3.1%) for Medicaid eligible children, with family incomes up to 200% of the FPL, was consistently greater than that for Non-Medicaid children (0.8% – 1.1%) over the four counts. Similarly, the national prevalence rate of reported limitations for children in lower income families (2.3% – 2.9%) was greater than for children in families with incomes greater than 200% of the FPL (1.4% – 1.5%). The proportion of enrolled children who were Medicaid eligible (70%) remained stable over time and was significantly greater than that for all children in Washington (42% – 45%).

For all Washington births, rural counties as a group have moderately higher enrollment rates (2.3% – 2.7%) than small urban counties (1.6% – 2.2%) and substantially higher enrollment rates than metropolitan counties (1.2% – 1.8%). For the May 1, 1996, count for all Washington births, enrollment rates for rural and small urban county groups (2.7% and 2.2%, respectively) were higher than for Washington State overall (2.0%). When Medicaid eligible children were considered separately from higher income children, the differences in enrollment rates were smaller. This suggests that differing levels of poverty in different regions of Washington contribute to the higher enrollment rates for rural and small urban county groups.

A number of risk factors associated with enrollment in publicly funded early intervention programs were described. The highest enrollment rates occurred among very low birthweight infants (21.8%) and extremely preterm infants (19.3%). (These two groups may demonstrate considerable overlap.) Enrollment rates between 5% and 10% were

found for medium low birthweight infants, moderately preterm infants, infants with Apgar scores of less than 8, infants born to mothers who received no prenatal care or who had been identified as substance abusers or who were less than 15 years old. Enrollment rates for male infants and for infants born to mothers who smoked, were single, had low educational attainment, or had three or more prior births, were somewhat higher (from 2.6% to 3.9%) than the rate for all Washington births (2.3%).

Enrollment rates for specific medical conditions were also studied for Medicaid eligible children. Enrollment rates were highest for Medicaid eligible children with Down syndrome (87.7%) and cerebral palsy (65.3%). Both of these conditions are included on Washington State's list of conditions with a high probability of resulting in developmental delay and each is sufficient to qualify a child for early intervention services. Enrollment rates for children with cerebral palsy and hearing loss increased significantly over the time period of this study. The enrollment rate for Medicaid eligible two-year-olds diagnosed with cerebral palsy has increased nearly 2.5 times from the first count (37.1%) to the last count (92.1%).

Medicaid eligible children diagnosed with other conditions associated with developmental delay also had high enrollment rates: cleft lip and/or palate (62.6%), developmental speech and language disorder (42.4%), and other developmental disorder or delay (41.1%).

The average Medicaid expenditure for all Washington born children enrolled in early intervention programs ($17,293) was nearly eight times the average expenditure for Medicaid children not enrolled ($2,236). While Medicaid expenditures reflect only a portion of the costs of caring for developmentally delayed or disabled children, the difference in expenditures does indicate a high prevalence of expensive medical treatments among enrolled children.

The analyses and results presented here provide baseline data for planning and discussion at the state and local levels, and facilitate decision making and priority setting for Washington's early intervention programs for infants and toddlers. Many questions remain to be explored in future studies. The relationship between the enrolled population compared to the population that has not received services has not been addressed here. As well, the comprehensiveness or appropriateness of the services received compared to the individual child's needs is another issue for further study. Tracking outcomes for enrolled children at older ages could address many concerns about the long-term effectiveness of these programs.

REFERENCES

Ainsworth MDS. (1973) The Development of Infant-mother Attachment. In BM Caldwell and H Ricciutti (Eds.), *Review of Child Development Research,* Chicago: University of Chicago Press, pp. 1-94.

Andrews H, Goldberg D, Wellen N, Pittman B, Struening E. (1995) Prediction of Special Education Placement from Birth Certificate Data. Research Linkages Between Academia and Practice. *American Journal of Preventive Medicine* 11(3)(Supplement): 55-61.

Bee HL, Barnard KE, Eyres SJ, Gray CA, Hammond MA, Spietz AL, Snyder C, Clark B. (1982) Prediction of IQ and Language Skill from Perinatal Status, Child Performance, Family Characteristics, and Mother-infant Interaction. *Child Development* 53: 1134-1156.

Bennett FC and Guralnick MJ. (1991) Effectiveness of Developmental Intervention in the First Five Years of Life. *Pediatric Clinics of North America* 38(6): 1513-1528.

Blair C, Ramey CT, Hardin JM. (1995) Early Intervention for Low Birthweight, Premature Infants: Participation and Intellectual Development. *American Journal on Mental Retardation* 99(5): 542-554.

Bowlby F. (1969) *Attachment.* New York: Basis Books.

Breitmayer BJ and Ramey CT. (1986) Biological Nonoptimality and Quality of Postnatal Environment as Codeterminants of Intellectual Development. *Child Development* 57: 1151-1165.

Casto GC and Mastropieri MA. (1986) The Efficacy of Early Intervention Programs: A Meta-Analysis. *Exceptional Children* 52(5): 417-424.

Casto GC and White KR. (1984) The Efficacy of Early Intervention Programs with Environmentally At-risk Infants. *Journal of Children in Contemporary Society* 17(1): 37-50.

Cawthon L and Schubert S. (1996) *First Steps Program Outcomes.* Manuscript in Preparation. Olympia, Washington: Department of Social and Health Services.

Cawthon L, Keenan T, Hodgson S, Bowden J, Shureen A. (1995) *Infant Toddler Early Intervention Program Study: Enrollment of Children with Disabilities and Special Health Care Needs in Washington State Public Programs May 1, 1995.* Olympia, Washington: Department of Social and Health Services.

Children's Defense Fund. (1994) *The State of America's Children: Yearbook 1994.* Washington, DC: Children's Defense Fund.

First LR and Palfrey JS. (1994) The Infant or Young Child With Developmental Delays. *The New England Journal of Medicine* 330(7): 478-483.

Hanson MJ and Lynch EW. (1995) *Early Intervention Implementing Child and Family Services for Infants and Toddlers Who Are At-Risk or Disabled.* Austin, Texas: pro-ed.

Harding E and Keating B. (1995) *Birth to Three Years Study: Technical Appendices.* Washington State Institute for Public Policy, Olympia, Washington: Legislative Budget Committee.

Healthy People 2000: National Health Promotion and Disease Prevention Objectives. (1991) Washington, DC: Public Health Service, DSHS Publication Number (PHS) 91-50212.

Jones CL and Lopez RE. (1990) Drug Abuse and Pregnancy. In Merkatz IR and Thompson JE (Eds.), *New Perspectives on Prenatal Care*, New York: Elsevier, pp. 273-318.

Keenan T, Hopps D, Cawthon L, Bowden J, Dickey R, Loerch S, Shureen A. (1996) *Washington's Infant Toddler Early Intervention Program Study: Enrollment of Washington Children with Disabilities and Special Health Care Needs in Washington State Public Programs on December 1, 1995.* Olympia, Washington: Department of Social and Health Services.

Kerner JF, Dusenbury L, Mandelblatt JS. (1993) Poverty and Cultural Diversity: Challenges for Health Promotion Among the Medically Underserved. *Annual Review of Public Health* 14: 355-377.

King EH, Logsdon DA, Schroeder, SR. (1992) Risk Factors for Developmental Delay Among Infants and Toddlers. *Children's Health Care* 21(1): 39-52.

Kochanek TT, Kabacoff RI, Lipsitt LP. (1987) Early Detection of Handicapping Conditions in Infancy and Early Childhood: Toward a Multivariate Model. *Journal of Developmental Psychology* 8: 411-420.

Kotelchuck M. (1994) An Evaluation of the Kessner Adequacy of Prenatal Care Index and a Proposed Adequacy of Prenatal Care Utilization Index. *American Journal of Public Health* 84(9): 1414-1420.

Lazar I and Darlington R. (1982) Lasting Effects of Early Intervention: A Report from the Consortium for Longitudinal Studies. *Monographs of the Society for Research in Child Development* 47 (Serial No. 195).

Lonner T, Hempleman B, Cawthon L, Longhi D, Kohlenberg L, Hodgson S. (1994) *Birth to Three Early Intervention Study: Enrollment of Children with Disabilities and Special Health Care Needs in Washington State Public Programs.* Olympia, Washington: Department of Social and Health Services.

Martin EW, Martin R, Terman DL. (1996) The Legislative and Litigation History of Special Education. *The Future of Children: Special Education for Students with Disabilities* 6(1): 25-39.

Mullen P. (1990) Smoking Cessation Counseling in Prenatal Care. In Merkatz IR and Thompson JE (Eds.), *New Perspectives on Prenatal Care*, New York: Elsevier, pp. 161-176.

Palfrey JS, Singer JD, Walker DK, Butler JA. (1987) Early Identification of Children's Special Needs: A Study in Five Metropolitan Communities. *Journal of Pediatrics* 11(5): 111-659.

Ramey CT, Bryant DM, Wasik BH, Sparling JJ, Fendt KH, LaVange LM. (1992) Infant Health and Development Program for Low Birth Weight, Premature Infants: Program Elements, Family Participation, and Child Intelligence. *Pediatrics* 3: 454-465.

Ramey CT and Campbell PA. (1992) Poverty, Early Childhood Education, and Academic Competence: The Abecedarian Experiment. In Huston A (Ed.), *Children In Poverty*. New York: Cambridge University Press, pp. 190-221.

Ramey CT, Stedman DJ, Borders-Patterson A Mengel W. (1978) Predicting School Failure from Information Avaliable at Birth. *American Journal of Mental Deficiency* 82(6): 525-534.

Rauh VA, Achenbach TM, Nurcombe B, Howell CT, Teti DM. (1988) Minimizing Adverse Effects of Low Birthweight: Four-Year Results of an Early Intervention Program. *Child Development* 59: 544-553.

Rojahn J, Aman MG, Marshburn E, Moeschberger ML, King EH, Logsdon DA, Schroeder SR. (1995) Biological and Environmental Risk for Poor Developmental Outcome of Young Children. *American Journal on Mental Retardation* 97(6): 702-708, 1993.

Sameroff AJ and Chandler MJ. (1975) Reproductive Risk and the Continuum of Caretaking Casualty. In Horowitz (Ed.), *Review of Child Development Research*, Chicago: University of Chicago Press 4: 187-244.

Scarr-Salapatek S and Williams ML. (1973) The Effects of Early Stimulation on Low-birth-weight Infants. *Child Development* 44: 94-101.

Shonkoff JP and Hauser-Cram P. (1987) Early Intervention for Disabled Infants and Their Families: A Quantitative Analysis. *Pediatrics* 80(5): 650-658.

Tjossem TD. (1976) Early Intervention: Issues and Approaches. In Tjossem TD (Ed.), *Intervention Strategies for High Risk Infants and Young Children*. Baltimore: University Park Press, pp. 3-33.

Wasik BH, Ramey CT, Bryant DM, Sparling JJ. (1990) A Longitudinal Study of Two Early Intervention Strategies: Project CARE. *Child Development* 61: 1682-1696.

APPENDICES

APPENDIX A

STATE DEFINITIONS OF DEVELOPMENTAL DELAY FOR CHILDREN BIRTH TO THREE WITH DISABILITIES

As a participant in IDEA Part H, Washington State is required to define *developmental delay*. Children meeting this definition of developmental delay are eligible to receive Part H services. (Federal Register, July 30, 1993, Dept. of Ed. 34 CFR 303.300)

State agencies may use definitions of developmental delay which differ slightly from the Washington State Part H definition. The Washington State Part H definition is an example of criteria used in determining eligibility for state funded early intervention programs.

The following definition of developmental delay is taken from the FFY 1994 – 1996 Washington State application for federal assistance under IDEA Part H, submitted to the Department of Education Office of Special Education Programs:

1. Developmental Delay:
   a. A child shall be eligible if he or she demonstrates a 1.5 standard deviation or twenty-five percent of chronological delay in one or more of the following developmental areas as measured by qualified personnel:
      i. Cognitive;
      ii. Physical (vision, hearing, fine or gross motor);
      iii. Communication;
      iv. Social or Emotional; or
      v. Adaptive.
   b. A child shall be eligible if he or she has a diagnosed physical or mental condition that has a high probability of resulting in a developmental delay including, but not limited to:
      i. Chromosomal abnormalities associated with mental retardation, such as Down syndrome;
      ii. Congenital central nervous system birth defects or syndromes, such as myelomeningocele, fetal alcohol syndrome, or Cornelia de Lange syndrome;
      iii. Significant hearing or vision impairments, including deaf, blind, or deaf-blind;
      iv. Established central nervous system deficits resulting from hypoxia, trauma, or infection;
      v. Cerebral palsy;
      vi. Health impairments such as autism, epilepsy, neurological impairments, or other chronic or acute or degenerative health problems which adversely affects developmental performance;
      vii. Orthopedically impaired, which means impairments of the normal functions of muscles, joints, or bones due to congenital anomaly, disease, or permanent injury and adversely affects developmental performance;
      viii. Inborn errors of metabolism; or
      ix. Microcephaly.

APPENDIX B

UNDUPLICATION AND MATCH PROCEDURES

Analyses appearing in this report are based on an unduplicated listing of children enrolled in early intervention programs on the dates of four separate counts (December 1, 1993, May 1, 1995, December 1, 1995, and May 1, 1996) which has been matched with the First Steps Database (FSDB). This analysis tool is the result of an unduplication and match process conducted by the Research and Data Analysis office (RDA).

The unduplication and match involved two stages. First, each individual count was internally unduplicated and matched with the FSDB. Second, records were matched across all of the four counts.

MATCHING CLIENT RECORDS

The basic task in the unduplication and match process is to find "matching" records, records which may contain differing pieces of information but which refer to the same child. This task can involve finding records from a single source that refer to the same child or finding matching records across different sources.

Prior to matching, records received in data collection were standardized to facilitate processing. Dates of birth were translated into a six digit month-day-year format. (e.g., "1-JAN-94" became "010194".) Names were translated into all uppercase letters, non-letter symbols were removed, and common prefixes, such as "MC" and "DELA" were combined into the succeeding name. (e.g., "MC MAHAN" became "MCMAHAN".)

Matching was conducted using a combination of computer processing and analyst evaluation of potential matches. This combination was designed to efficiently identify records which belong to a single child while avoiding acceptance of invalid matches.

Computer Processing

Computer processing identified potential matches in a three-step operation. First, candidate matches were found. In general, two records were considered a candidate match if they shared a same first name, last name, or date of birth. Name identifiers must have had the same spelling to have caused records to be flagged as candidate matches.

Second, candidate matches were scored based on the amount of information shared between the two records. For example, a candidate match that shared a first name and five digits of a date of birth would score higher than a candidate match that shared a first name only.

Third, two data sets were output. Candidate matches which shared all three identifiers—first name, last name, and date of birth—were output to a data set of perfect matches which did not require further review. Candidate matches which shared many pieces of information, but not all three identifiers, were output to a data set of potential matches which required evaluation by an analyst. An example of a potential match is a pair of records that share the same last name and date of birth, but in which only the first letter of the first name is the same. Candidate matches with a minimum of shared information, for example, a first name only, were discarded.

Analyst Evaluation

An analyst evaluated potential matches by visually comparing the information from the records in a given potential match. In many cases, records for the same child had a dissimilar piece of information, such as different spellings of a name, which prevented them from being perfect matches. In these cases, the analyst was able to judge that the records were sufficiently the same and, in this way, confirm that the match was legitimate.

PROCESSING INDIVIDUAL COUNTS

After completing data collection for a count, an interim unduplicated data set of enrolled children matched with the FSDB was created. While the order and nature of specific steps varied across counts, in general each interim data set was the result of a process involving an internal unduplication of records received in data collection and a match of unduplicated records with the FSDB. For the first three counts, the interim data set was used to prepare a report on early intervention enrollment on the date of the count.

Internal Unduplication

For a given count, receipt of more than one record from provider surveys and agency databases for a single child was common. As a first step in internal unduplication, these records were checked against each other for matches.

After matches were identified, duplicate records were then compressed. All of the information was taken from one record in each matched set and any different pieces of information that appeared in its matches, for example alternate spelling of a name or a second last name, were added. Records without matches were included without changes. This created an unduplicated data set in which identified duplicate records had been combined into single records.

Match with the FSDB

In order to analyze enrollment using information in the FSDB, the unduplicated records from each count were matched with records in the FSDB. When matching records were identified, an identifier was added to the early intervention enrollment records linking that record to its match in the FSDB.

The process of matching with the FSDB improved the accuracy and completeness of internal unduplication. Additional information contained in birth certificates, for example the mother's maiden name or indicators of multiple births, revealed new cases of duplicate early intervention records as well as early intervention records which had been improperly unduplicated.

Note that a match with the FSDB was not conducted separately for the fourth count. Instead, the match with the FSDB for the fourth count occurred within the match across counts.

MATCH ACROSS COUNTS

Following the internal unduplication of the fourth and final count, a match was conducted across counts to determine when the same child appeared in more than one count.

In the match across counts, the first and second counts were initially matched with each other and a compressed, unduplicated data set was created. This data set was then matched with a compressed, unduplicated data set from the third and fourth counts.

In many cases, records not previously linked to the FSDB matched with a record that was linked. As a result, these records became linked to the FSDB. At this point, records that were not yet linked were used for a final match with the FSDB. In this way, children whose birth certificates became available after their count and those who were in the fourth count could be matched with their birth certificates.

In addition to creating links between records in different counts, the match across counts improved the completeness and accuracy of both the internal unduplication and the match with the FSDB for the various counts. The following three conditions caused this change in the content of the data for individual counts:

Availability of additional birth certificates in the FSDB. RDA receives a calendar year's birth certificates from DOH Center for Health Statistics on average approximately nine months after the end of that calendar year. As a result, the FSDB contained births certificates which were not available when the first and second counts (December 1, 1993, and May 1, 1995) were matched with the FSDB. The availability of additional birth certificates increased the number of early intervention records that are linked to the FSDB as well as improved the accuracy and completeness of internal unduplication.

Availability of new information from other counts. Identifying information in early intervention records was, in some cases, incomplete or inaccurate. This is especially true in the first count (December 1, 1993), where provider surveys collected only the first initial, the first five letters of the last name, and the date of birth for each client. For a given count, a record from a different count might contain information that linked it to two previously undiscovered duplicate records or might contain information which revealed that records had been improperly unduplicated.

Refinements in unduplication and match procedures. Over the course of conducting numerous matches, including matches done for clients other than the ITEIP study, RDA staff have identified refinements which could be made to the unduplication and match procedures. The match across counts utilized these refinements, which improved the accuracy and completeness of internal unduplication and the match with the FSDB.

CHANGES IN FIGURES FROM PREVIOUS REPORTS

As noted above, the match across counts changed the content of the data for the individual counts. As a result, figures for certain items in this report differ from the corresponding figures in previous reports, which were generated from *interim* data sets. The figures which appear in this report are revisions of figures in previous reports.

The table below details changes in certain summary measures between previous reports and this report.

	Count 1 Dec. 1, 1993	Count 2 May 1, 1995	Count 3 Dec. 1, 1995	Count 4 May 1, 1996
Previous Reports:				
Total Enrolled	4,324	4,234	4,197	N/A (Not Avail.)
WA Population under 3	264,410	238,319	238,314	N/A
WA State Enrollment Rate	*1.64%*	*1.78%*	*1.76%*	
Enrolled WA Births*	2,586	2,684	2,883	N/A
Total Enrolled, BC Available*	3,351	3,404	3,456	N/A
Match Rate	*77.2%*	*78.8%*	*83.4%*	
Enrolled WA Births*	2,586	2,684	2,883	N/A
Washington Births*	161,043	131,486	161,657	N/A
Enrollment Rate	*1.61%*	*2.04%*	*1.78%*	
Current Report:				
Total Enrolled	4,055	4,173	4,138	4,213
WA Population under 3	245,182	238,314	238,314	234,894
WA State Enrollment Rate	*1.65%*	*1.75%*	*1.74%*	*1.79%*
Enrolled WA Births**	3,397	3,600	2,945	2,605
Total Enrolled, BC Available**	4,055	4,141	3,446	3,063
Match Rate	*83.8%*	*86.9%*	*85.5%*	*85.0%*
Enrolled WA Births**	3,397	3,600	2,945	2,605
Washington Births**	237,102	208,466	161,657	129,665
Enrollment Rate	*1.43%*	*1.73%*	*1.82%*	*2.01%*

* *For previous reports, available birth certificates (BC) depended on the timing of the count. Birth certificates were not available -- Count 1: January 1, 1993, through December 1, 1993. Count 2: January 1, 1994, through May 1, 1995. Count 3: January 1, 1995, through December 1, 1995.*

** *For the current report, birth certificates were not available for births after 1994. Birth certificates were not available – Count 2: January 1, 1995, through May 1, 1995. Count 3: January 1, 1995, through December 1, 1995. Count 4: January 1, 1995, through May 1, 1996.*

- Washington Population under 3 decreased for the first count between reports. Washington Population under 3 in the report for the first count was based on an extrapolation from county level population figures for children under the age of five. In the current report, Washington Population under 3 for all counts is the OFM population estimate for April 1 in the year of the count. The last digit in Washington population under three was misprinted in the report for the second count.

- For all three previously reported counts, Total Enrolled has declined between reports due to greater completeness in unduplication. The largest decline occurred for the first count because less information was collected in provider surveys for that count. Incomplete name information caused the first count to have the least complete internal unduplication at the time of the count. As a result, the first count had a greater potential for further unduplication in the match across counts.

- For the first two counts, Total Enrolled, Birth Certificate (BC) Available increased between reports because a year of birth certificates became available for those counts. (See footnote to table.) The increase for the first two counts in Washington Births between reports reflects the additional available birth certificates.

- No additional birth certificates became available for count three. The decline in Total Enrolled, Birth Certificate (BC) Available between reports for count three is due to greater completeness in unduplication.

- For all three previously reported counts, Enrolled Washington Births increased between reports. For the first two counts, most of this increase was the result of an increase in available birth certificates. Part of the increase in the first two counts and all of the increase in count three was the result of additional matches found in the match across counts.

- For the first two counts, the Enrollment Rate for Washington Births decreased between reports because birth certificates became available for the most recent births. As a result, the youngest children that were under the age of three at the time of the counts now had birth certificates available. Because younger children have had less time to have delaying and disabling conditions identified, the inclusion of younger children into the calculation of the enrollment rates caused the enrollment rates to decline.

The unduplication and match process uses available information to identify records as belonging to the same individual. New information increases the accuracy and completeness of an unduplication and match. This change in the underlying data can lead to revisions of previously reported figures.

The figures in this report may be revised as birth certificates become available to the FSDB and as additional counts are conducted.

APPENDIX C

NATIONAL HEALTH INTERVIEW SURVEY

This report uses results from the National Health Interview Survey (NHIS) to estimate the prevalence of developmental delays and disabilities in the United States. National prevalence rates calculated from the NHIS make it possible to evaluate whether enrollment rates are consistent with the expected occurrence of developmental disabilities in various populations.

The NHIS is an annual comprehensive survey of health conditions in a sample of households throughout the United States. The U.S. Bureau of the Census (USBC) conducts interviews for the NHIS under the direction of the National Center for Health Statistics (NCHS). The NCHS processes data received from the USBC and distributes data files that can be used in computing statistics.

The NHIS is conducted using a stratified sample survey design. A disproportionate number of certain populations, such as some ethnic minorities, are interviewed, increasing the accuracy of statistics for those populations.

This report uses NHIS data from the 1988 through 1993 surveys. The following table presents information about the size of the NHIS sample during these years.

	NHIS Year					
	1988	1989	1990	1991	1992	1993
Households in NHIS	47,485	45,711	46,476	46,761	49,401	43,007
Persons in NHIS	122,310	116,929	119,631	120,032	128,412	109,671
Persons under 3 in NHIS	5,923	5,713	5,869	6,015	6,511	5,161

The NHIS contains detailed demographic and health data collected from a large number of households in the United States. As a result, it is a useful source of information about the health of the U.S. population.

METHODS

Each count is compared to a different range of NHIS years. This report selected for each of the first three counts the range of NHIS years that was used in previous reports. For the last count, the most recent two years of available NHIS data were used. The assignments of NHIS years are as follows:

Count:	NHIS Years:
December 1, 1993	1988 – 1991
May 1, 1995	1991 – 1992
December 1, 1995	1991 – 1993
May 1, 1996	1992 – 1993

NHIS Analysis Groups

Persons in the NHIS were grouped by the following characteristics: age, race/ethnicity, poverty status, and limitations in activity.

Races/ethnicities included in the NHIS were translated into the groups which appear in this report. A number of Asian and Pacific Island nationalities were combined into a single Asian/Pacific Islander group. American Indian, Aleut, and Eskimo were combined into the Native American group. Hispanic ethnicity is reported in the NHIS using a variable separate from race. Any child reported to be Hispanic was assigned to the Hispanic group, regardless of race.

This study grouped children in the NHIS according to whether their family incomes were above or below 200% of the Federal Poverty Level (FPL). Family income and family size were evaluated for each child in the NHIS to determine their poverty status. USBC poverty thresholds corresponding to the NHIS year were used for criteria.

Respondents in the NHIS are asked to identify persons in their household who are *limited in a major or minor activity*. This study used reported limitations in the NHIS as an indicator of *developmental delay or disability*. (*Please see the following section titled* LIMITATIONS OF THE NHIS.)

Weighting

Because the NHIS over-samples certain groups, these groups will be over-represented in statistics computed from NHIS data. (For example, if a certain race/ethnicity is over-sampled, a higher percentage of persons would have that race/ethnicity in the NHIS than in the United States population. If that race/ethnicity had a higher prevalence rate for activity limitations, computing a prevalence rate for all persons in the NHIS would overstate the prevalence rate for the United States population.)

NHIS data includes a weighting factor for each record which is used to control for over-sampling. NHIS statistics appearing in this report have been computed using the weighting factor. The weighting factor was not used in calculating NHIS statistics in the reports for the December 1, 1993, and the May 1, 1995, counts. As a result, figures from the NHIS appearing in this report may not match corresponding figures appearing in those reports.

NHIS Adjusted for Washington Poverty

The population of Washington State has a different poverty profile than the population of the United States. Poverty is associated with an increased likelihood of developmental delay or disability. (*Please see* ENVIRONMENTAL RISK FACTORS *in* CHAPTER 6: RISK FACTORS.) In order to derive from the NHIS a prevalence rate that reflects Washington's poverty profile, the national prevalence rate was adjusted for Washington poverty.

For each count, prevalence rates were calculated from the NHIS for three income groups: 0 – 100% FPL, 100 – 200% FPL, and greater than 200% FPL. These prevalence rates were multiplied by the proportion of Washington residents under the age of three in the corresponding income groups. The sum of these three products is the NHIS prevalence rate adjusted for Washington poverty.

Calculation of the NHIS Adjusted for Washington Poverty

	NHIS % Limited	WA Poverty Distribution, Children under Three *		% Limited of Total WA Pop.	NHIS Adjusted for WA Poverty
December 1, 1993:					
0 - 100% FPL	3.05%	0 - 100% FPL	0.132	0.40%	
100 - 200% FPL	1.54%	100 - 200% FPL	0.293	0.45%	**1.75%**
> 200% FPL	1.47%	> 200% FPL	0.610	0.90%	
May 1, 1995:					
0 - 100% FPL	3.00%			0.40%	
100 - 200% FPL	1.89%			0.55%	**1.88%**
> 200% FPL	1.53%			0.93%	
December 1, 1995:					
0 - 100% FPL	3.12%			0.41%	
100 - 200% FPL	2.32%			0.68%	**2.00%**
> 200% FPL	1.49%			0.91%	
May 1, 1996:					
0 - 100% FPL	3.03%			0.40%	
100 - 200% FPL	2.69%			0.79%	**2.06%**
> 200% FPL	1.43%			0.87%	

* *The Washington poverty distribution for children under three was calculated using figures from the summary tape files for the 1990 Census of the Population. The same distribution was used in adjustments for all four counts.*

LIMITATIONS OF THE NHIS

The following limitations must be considered when comparing early intervention enrollment statistics to NHIS calculations:

Low Number of Observations

- To calculate prevalence rates for different populations, the NHIS sample was divided into various groups. In some cases, a low number of NHIS records fit into a certain group. For such groups, small changes in the number of children reported with limitations had a large impact on the prevalence rate. As a result, prevalence rates may fluctuate.

Developmental Disability vs. Limitation in Activity

- A person in the NHIS has a limitation in activity if a respondent reports that that person has one of the following limitations: unable to perform major activity, limited in kind/amount major activity, or limited in other activities. By way of contrast, individuals are eligible for Part H services in Washington State if they have a 1.5 standard deviation or 25 percent of chronological age delay in one or more of five developmental areas or a diagnosed physical or mental condition that has a high probability of resulting in developmental delay. (*Please see* APPENDIX A: STATE DEFINITIONS OF DEVELOPMENTAL DELAY.)

  It is likely that there is substantial overlap in the definitions for limitations in activity and the eligibility criteria for early intervention programs. However, statistics calculated from the NHIS are estimates only. They are not precise measures of the prevalence and characteristics of children in Washington State who are eligible for early intervention services.

Eligible vs. Enrolled

- Statistics calculated from the NHIS are estimates for children who are eligible for early intervention services. Children are selected from the NHIS if they appear to have developmental disabilities, not if they are enrolled in a publicly-funded early intervention program.

  This report studies children who are enrolled in publicly funded early intervention programs. Some families may not seek publicly funded early intervention services for their children with delaying or disabling conditions. Early intervention services may, alternatively, be funded through private pay, private insurance, military programs, or charitable grants.

  Prevalence estimates of eligible children are expected to exceed actual enrollment rates.

APPENDIX D

COUNTY ENROLLMENT DETAIL

Enrollment on December 1, 1993, by County of Residence
All Children and Medicaid Eligible Children
Born to Washington Mothers December 1, 1990, to December 1, 1993

	Medicaid				All Births			
County	Enrolled Births	WA Births	Enroll. Rate	Index	Enrolled Births	WA Births	Enroll. Rate	Index
Clark	87	4,622	1.9%	0.80	139	12,157	1.1%	0.80
King	477	21,995	2.2%	0.92	776	67,993	1.1%	0.80
Pierce	225	12,279	1.8%	0.78	339	30,798	1.1%	0.77
Snohomish	229	7,623	3.0%	1.27	381	24,264	1.6%	1.10
Spokane	175	7,990	2.2%	0.93	238	17,057	1.4%	0.97
Metro Total	**1,193**	**54,509**	**2.2%**	**0.93**	**1,873**	**152,269**	**1.2%**	**0.86**
Benton	55	2,670	2.1%	0.87	85	5,812	1.5%	1.02
Cowlitz	75	2,038	3.7%	1.56	86	3,778	2.3%	1.59
Franklin	36	2,119	1.7%	0.72	49	2,907	1.7%	1.18
Kitsap	58	3,106	1.9%	0.79	121	10,139	1.2%	0.83
Lewis	70	1,505	4.7%	1.97	90	2,564	3.5%	2.45
Skagit	22	1,926	1.1%	0.48	25	3,861	0.6%	0.45
Thurston	61	2,891	2.1%	0.89	98	7,317	1.3%	0.93
Walla Walla	36	1,303	2.8%	1.17	42	2,119	2.0%	1.38
Whatcom	56	2,362	2.4%	1.00	92	5,712	1.6%	1.12
Yakima	183	9,608	1.9%	0.81	206	12,866	1.6%	1.12
S.U. Total	**652**	**29,528**	**2.2%**	**0.94**	**894**	**57,075**	**1.6%**	**1.09**
Adams	9	706	1.3%	0.54	10	929	1.1%	0.75
Asotin	27	500	5.4%	2.29	31	790	3.9%	2.74
Chelan	52	1,913	2.7%	1.15	59	2,843	2.1%	1.45
Clallam	44	1,128	3.9%	1.65	54	2,082	2.6%	1.81
Columbia	6	97	6.2%	2.62	7	147	4.8%	3.32
Douglas	12	787	1.5%	0.65	15	1,238	1.2%	0.85
Ferry	5	168	3.0%	1.26	5	251	2.0%	1.39
Garfield	0	35	0.0%	0.00	0	64	0.0%	0.00
Grant	48	2,326	2.1%	0.87	55	3,378	1.6%	1.14
Grays Harbor	131	1,857	7.1%	2.99	148	2,792	5.3%	3.70
Island	20	678	2.9%	1.25	43	3,128	1.4%	0.96
Jefferson	21	423	5.0%	2.10	25	708	3.5%	2.46
Kittitas	13	493	2.6%	1.12	15	937	1.6%	1.12
Klickitat	5	486	1.0%	0.44	6	711	0.8%	0.59
Lincoln	6	135	4.4%	1.88	8	303	2.6%	1.84
Mason	22	850	2.6%	1.10	29	1,487	2.0%	1.36
Okanogan	41	1,294	3.2%	1.34	45	1,674	2.7%	1.88
Pacific	18	444	4.1%	1.72	20	667	3.0%	2.09
Pend Oreille	5	274	1.8%	0.77	7	401	1.7%	1.22
San Juan	2	154	1.3%	0.55	3	333	0.9%	0.63
Skamania	4	164	2.4%	1.03	6	295	2.0%	1.42
Stevens	21	827	2.5%	1.08	23	1,239	1.9%	1.30
Wahkiakum	1	44	2.3%	0.96	2	96	2.1%	1.45
Whitman	10	504	2.0%	0.84	14	1,243	1.1%	0.79
Rural Total	**523**	**16,287**	**3.2%**	**1.36**	**630**	**27,736**	**2.3%**	**1.59**
State Total*	**2,368**	**100,337**	**2.4%**	**1.00**	**3,397**	**237,102**	**1.4%**	**1.00**

* *Some children could not be assigned a county of residence. As a result, state totals may be slightly higher than the sums of counties.*

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Enrollment on May 1, 1995, by County of Residence
All Children and Medicaid Eligible Children
Born to Washington Mothers May 1, 1992 to December 31, 1994

County	Medicaid Enrolled Births	Medicaid WA Births	Medicaid Enroll. Rate	Medicaid Index	All Births Enrolled Births	All Births WA Births	All Births Enroll. Rate	All Births Index
Clark	88	4,433	2.0%	0.73	150	11,128	1.3%	0.78
King	486	20,956	2.3%	0.86	767	59,618	1.3%	0.74
Pierce	256	11,181	2.3%	0.84	380	26,681	1.4%	0.82
Snohomish	215	7,274	3.0%	1.09	374	21,178	1.8%	1.02
Spokane	214	7,175	3.0%	1.10	291	14,759	2.0%	1.14
Metro Total	**1,259**	**51,019**	**2.5%**	**0.91**	**1,962**	**133,364**	**1.5%**	**0.85**
Benton	59	2,391	2.5%	0.91	99	5,242	1.9%	1.09
Cowlitz	88	1,801	4.9%	1.80	99	3,196	3.1%	1.79
Franklin	53	1,957	2.7%	1.00	75	2,642	2.8%	1.64
Kitsap	63	2,930	2.2%	0.79	117	8,840	1.3%	0.77
Lewis	93	1,400	6.6%	2.45	109	2,247	4.9%	2.81
Skagit	35	1,815	1.9%	0.71	44	3,457	1.3%	0.74
Thurston	73	2,742	2.7%	0.98	102	6,510	1.6%	0.91
Walla Walla	32	1,162	2.8%	1.02	45	1,831	2.5%	1.42
Whatcom	76	2,254	3.4%	1.24	125	5,091	2.5%	1.42
Yakima	187	8,760	2.1%	0.79	208	11,481	1.8%	1.05
S.U. Total	**759**	**27,212**	**2.8%**	**1.03**	**1,023**	**50,537**	**2.0%**	**1.17**
Adams	10	646	1.5%	0.57	10	825	1.2%	0.70
Asotin	26	430	6.0%	2.23	27	674	4.0%	2.32
Chelan	55	1,803	3.1%	1.13	62	2,613	2.4%	1.37
Clallam	32	988	3.2%	1.19	46	1,729	2.7%	1.54
Columbia	2	82	2.4%	0.90	2	129	1.6%	0.90
Douglas	18	772	2.3%	0.86	18	1,174	1.5%	0.89
Ferry	1	159	0.6%	0.23	2	217	0.9%	0.53
Garfield	1	32	3.1%	1.15	1	49	2.0%	1.18
Grant	54	2,126	2.5%	0.94	66	3,081	2.1%	1.24
Grays Harbor	112	1,575	7.1%	2.62	124	2,304	5.4%	3.12
Island	21	728	2.9%	1.06	43	2,798	1.5%	0.89
Jefferson	24	391	6.1%	2.26	32	613	5.2%	3.02
Kittitas	9	417	2.2%	0.80	11	799	1.4%	0.80
Klickitat	5	430	1.2%	0.43	7	609	1.1%	0.67
Lincoln	7	122	5.7%	2.12	10	290	3.4%	2.00
Mason	33	791	4.2%	1.54	41	1,362	3.0%	1.74
Okanogan	40	1,193	3.4%	1.24	43	1,503	2.9%	1.66
Pacific	18	418	4.3%	1.59	19	612	3.1%	1.80
Pend Oreille	4	256	1.6%	0.58	4	362	1.1%	0.64
San Juan	1	142	0.7%	0.26	3	285	1.1%	0.61
Skamania	3	132	2.3%	0.84	4	227	1.8%	1.02
Stevens	21	765	2.7%	1.01	25	1,130	2.2%	1.28
Wahkiakum	0	46	0.0%	0.00	1	88	1.1%	0.66
Whitman	8	457	1.8%	0.65	12	1,073	1.1%	0.65
Rural Total	**505**	**14,901**	**3.4%**	**1.25**	**613**	**24,546**	**2.5%**	**1.45**
State Total*	**2,525**	**93,143**	**2.7%**	**1.00**	**3,600**	**208,466**	**1.7%**	**1.00**

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Enrollment on December 1, 1995, by County of Residence
All Children and Medicaid Eligible Children
Born to Washington Mothers December 1, 1992 to December 31, 1994

County	Medicaid Enrolled Births	Medicaid WA Births	Medicaid Enroll. Rate	Medicaid Index	All Births Enrolled Births	All Births WA Births	All Births Enroll. Rate	All Births Index
Clark	78	3,526	2.2%	0.79	125	8,824	1.4%	0.78
King	444	16,471	2.7%	0.96	664	46,008	1.4%	0.79
Pierce	239	8,759	2.7%	0.97	351	20,694	1.7%	0.93
Snohomish	165	5,715	2.9%	1.03	304	16,377	1.9%	1.02
Spokane	189	5,603	3.4%	1.20	258	11,469	2.2%	1.23
Metro Total	**1,115**	**40,074**	**2.8%**	**0.99**	**1,702**	**103,372**	**1.6%**	**0.90**
Benton	63	1,873	3.4%	1.20	97	4,056	2.4%	1.31
Cowlitz	59	1,420	4.2%	1.48	75	2,484	3.0%	1.66
Franklin	51	1,524	3.3%	1.19	62	2,060	3.0%	1.65
Kitsap	33	2,252	1.5%	0.52	72	6,672	1.1%	0.59
Lewis	56	1,106	5.1%	1.80	64	1,756	3.6%	2.00
Skagit	35	1,404	2.5%	0.89	56	2,659	2.1%	1.16
Thurston	52	2,146	2.4%	0.86	85	5,062	1.7%	0.92
Walla Walla	27	912	3.0%	1.06	38	1,430	2.7%	1.46
Whatcom	52	1,780	2.9%	1.04	81	4,013	2.0%	1.11
Yakima	117	6,914	1.7%	0.60	131	9,001	1.5%	0.80
S.U. Total	**545**	**21,331**	**2.6%**	**0.91**	**761**	**39,193**	**1.9%**	**1.07**
Adams	9	514	1.8%	0.62	10	655	1.5%	0.84
Asotin	15	329	4.6%	1.63	18	516	3.5%	1.91
Chelan	41	1,404	2.9%	1.04	44	2,005	2.2%	1.20
Clallam	36	782	4.6%	1.64	45	1,331	3.4%	1.86
Columbia	2	60	3.3%	1.19	2	97	2.1%	1.13
Douglas	16	612	2.6%	0.93	17	929	1.8%	1.00
Ferry	0	126	0.0%	0.00	1	169	0.6%	0.32
Garfield	1	25	4.0%	1.43	1	36	2.8%	1.52
Grant	42	1,685	2.5%	0.89	54	2,419	2.2%	1.23
Grays Harbor	71	1,231	5.8%	2.06	81	1,784	4.5%	2.49
Island	18	586	3.1%	1.09	37	2,132	1.7%	0.95
Jefferson	21	308	6.8%	2.43	25	473	5.3%	2.90
Kittitas	4	333	1.2%	0.43	4	613	0.7%	0.36
Klickitat	5	342	1.5%	0.52	9	481	1.9%	1.03
Lincoln	3	102	2.9%	1.05	3	234	1.3%	0.70
Mason	25	623	4.0%	1.43	32	1,068	3.0%	1.64
Okanogan	36	944	3.8%	1.36	38	1,182	3.2%	1.76
Pacific	11	324	3.4%	1.21	11	474	2.3%	1.27
Pend Oreille	8	199	4.0%	1.43	9	280	3.2%	1.76
San Juan	2	109	1.8%	0.65	5	218	2.3%	1.26
Skamania	3	105	2.9%	1.02	4	181	2.2%	1.21
Stevens	16	577	2.8%	0.99	19	867	2.2%	1.20
Wahkiakum	0	41	0.0%	0.00	2	72	2.8%	1.52
Whitman	6	369	1.6%	0.58	10	863	1.2%	0.64
Rural Total	**391**	**11,730**	**3.3%**	**1.19**	**481**	**19,079**	**2.5%**	**1.38**
State Total*	**2,052**	**73,141**	**2.8%**	**1.00**	**2,945**	**161,657**	**1.8%**	**1.00**

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Research and Data Analysis
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